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The Magazine of Landscape and Golf Course Management Since 1962

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Winter Damage Toll Is Up as Weather Fools Plants

Street Trees Must Change as Cities Change

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WEEDS TREES & TURF

The Magazine of Landscape and Golf Course Management Since 1962

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Normally temperate regions of the South were hit this winter with fluke cold spells. Horticulturist Michael Dirr describes why plants failed to adjust this winter.

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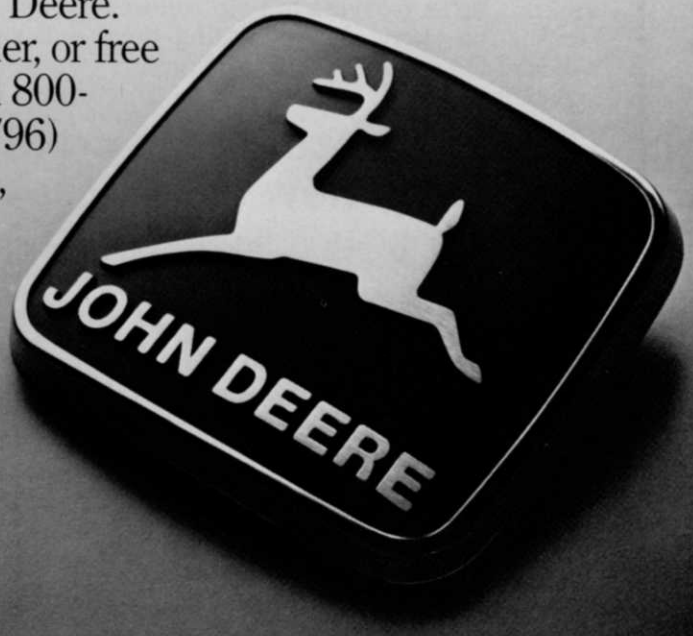

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by **Bruce F. Shank**, executive editor

Weather changes standards for cold hardiness in Texas

Tip of the Month—Ft. Worth, TX, Plant Pro Rich Pluenneke has reported plants currently rated to survive Texas winters are suffering severe damage this winter.

Some zone 7 and 8 plants are having trouble with the December low temperatures in the 20's. Ligustrum and oleander have been hit hard. "Losses were expected to reach 15 to 20 percent in December," Pluenneke said. "Recent checks indicate losses may go as high as 70 percent in Ft. Worth."

Turf has also been hit. Pluenneke said "Raleigh" St. Augustine appears winter-damaged in his area. "Raleigh" is a variety developed in North Carolina to withstand colder winter temperatures than other types of St. Augustine.

Although this winter may not be matched for years, Pluenneke thinks Texas landscape architects and contractors should take note of the losses and reevaluate the problem plants for their area.

Pinkus claims colleges care more about grants than students

Outgoing Associated Landscape Contractors of America President Dave Pinkus blasted colleges for caring more about grants than preparing students for the business world during a speech at ALCA's annual conference in Phoenix.

"Higher educational institutions are more interested in research grants and protection of tenured faculty than they are in producing marketable students," exclaimed Pinkus. "Our industry's number one problem is finding qualified people."

Pinkus outlined four areas where colleges fall short. Few schools require business courses for landscape contracting students, encourage students to gain industry exposure, have faculty with exposure to the landscape industry, and know individual needs of the landscape market or students.

"You could say colleges are cheating the students, fired Pinkus. ALCA is trying to help colleges to develop landscape contracting curricula by visiting them and explaining the needs of the market.

Changing technology creates shortfall in new talent

If your son or daughter is wondering what career to pursue, Dale E. Wolf thinks he or she should look into agricultural technology.

Wolf is group vice president, agricultural chemicals for Du Pont. "Technology is literally racing ahead in numerous fields today," Wolf points out. "We (agriculture) may be sidetracked simply because we cannot organize and train the necessary army of talented and highly trained scientists, technicians and managers. Too few American students recognize there are dozens of carreers in agriculture which will place them on the leading edge of major scientific developments."

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LAWNCARE

Chemical insanity defense flops in trial

A former lawn care company employee who balanced a murder defense on chemical intoxication was found guilty in a Massachussets courtroom in February in the garroting, bludgeoning death of a 34-year-old woman.

David Garabedian, 23, in a precedent-setting defense, alleged the chemicals he used as an employee at Old Fox Lawn Care, induced temporary insanity and caused him to strangle and bludgeon to death Eileen Muldoon, a Middlesex (Mass.) County woman. Muldoon caught Garabedian urinating in her yard while he was working in a neighboring yard. In the ensuing argument, Garabedian allegedly strangled and bludgeoned the woman with rocks from a nearby wall.

It took 16 jurors seven hours to reach the guilty verdict.

Industry reaction to the verdict has been mixed. Most lawn care operators, however, feel the whole incident was over much too quickly to have formed any kind of lasting public sentiment.

"It was a situation that could have taken place in any industry or in any business," said Paul Bizon of Prograss, Hubbard, OR. "It's unfortunate he (Garabedian) hung it on the chemical industry."

John Kenney, owner of Turf Doctor in Framingham, MA, and president of the Professional Lawn Care Association of America said, "If you let your imagination go, you could easily imagine any former employee who ever got a hangnail suing you for damages."

The impact of the trial on the convicted man's former employer has been "minimal" according to Dr. J. Wilkinson of Old Fox.

"We have not heard from any of our customers in regard to the trial whatsoever."

However, some lawn care operators voiced concern that ramifications from the trial may come down the road, such as around the routine spraying time of insecticides.

Wilkinson voiced some of the same sentiment.

"We don't know the impact it'll have on potential future customers who may never call because of the trial."

The controversial trial, did, however, bring to the fore once again a facet of the growing anti-pesticide movement in the country; a facet that has gained enough steam to be used as a murder defense.

Said Terry Witt of Dow Chemical USA, manufacturer of Dursban, the chemical of record in the case: "We were glad that the jury looked at the scientific data rather than at the emotional appeal which is attached to that plea. Obviously, one of the real concerns the industry faces is the anti-pesticide movement afoot within the country. One of our major challenges is to figure out how to communicate with the general public and translate some of our technical information to a level that people can comprehend."

INDUSTRY

Amfac to drop hort operations

Saying their horticulture businesses are not "conducive to effective corporate management," Amfac President and Chief Executive Officer Myron Du Bain has announced plans to divest those operations from the company as part of long-range restructuring plan.

The plan, designed to focus the firm's resources on high-margin and growth businesses, will divest Amfac of $177 million in assets that lost $48 million last year, Du Bain said. A $15 million after-tax reserve has been taken against Horticulture Group businesses, as well as $10 million against their west coast retail operations, Liberty House of California.

"Horticulture has proven to be, for Amfac, a series of small businesses which we do not believe to be conducive to effective corporate management," Du Bain said. "The nurseries segment of our business has been our biggest horticulture problem over the past two years, due principally to lengthy growing cycles and depressed housing starts during the 1981-83 time period."

John Mendez, executive vice president of Amfac's Horticulture Group, said five seperate business entities are involved in the divestiture: Cal-Turf sod producers (three locations), Jenco wholesale nurseries (four locations), three container nurseries, Garden Perry's (three locations) and two mail order operations—Gurney Seed and Henry Field.

Of the horticulture and retail operations, Du Bain said, "While these activities do not fit our growth plans, we and our investment bankers believe that they are attractive and desirable to others in their respective industries."

COVER STORY

National Arbor Day finally nears reality

After 40 years of trying, the Committee for National Arbor Day may be near their goal, to have the last Friday in April proclaimed Arbor Day across the country.

Today, 24 states have legislation recognizing trees on various days from February through May. The Committee believes the impact of a national day of recognition, the same day each year in every state, would be much greater. To this end, they have received support from more than 90 U.S. congressmen for the National Arbor Day Bill, H.J. Res. #71.

Harry J. Banker, national chairman of the Committee, believes passage of this bill is nearing reality and calls for all organizations and individuals in the landscape industries to ask their senators and representatives to support the legislation. Banker and many state Arbor Day chairman have persistently sought a national holiday for years. The idea was created in the early '40's by Clevelander Edward Scanlon.

Banker feels a national day is needed to counteract a relentless decrease in tree population caused by increasing maintenance costs and reduced planting space for trees. "Our large elms and soft maples cost many dollars to prune, spray and fertilize," Banker states.

These trees are not being replaced with lower maintenance trees as they are lost to insects, disease and weather damage. Arbor Day legislation would help in both planting and replacement of urban trees, Banker and his group of volunteers believe.

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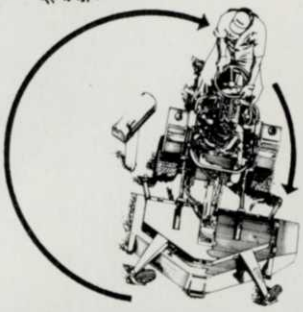

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UPDATE

GCSAA promotes Prusa

Jim Prusa, director of education for the Golf Course Superintendents Association of America, has added a new facet to his job - that of associate executive director.

John M. Schilling, executive director, said the appointment of Prusa will fill a long-standing need in the Association for a definite second executive in command.

"His responsibilities will include direct participation in the financial management of the Association as well as all operational decisions," said Schilling.

Witteveen Canada's top super

Gordon Witteveen, golf course superintendent of Toronto's prestigious Board of Trade Country Club, was named Canadian Golf Course Superintendent of the Year.

CGSA President-elect Steve Miller said Witteveen was a driving force behnd the formation of the CGSA and was instrumental in establishing the Greenmaster as the voice of the Canadian turfgrass industry.

"Florida Golfweek" tops - again

Out of a record 145 entries in seven categories, Fore and Florida Golfweek continued their domination of the Harry C. Eckhoff Award contest by taking first places for the third straight year in a row in their categories.

The contest, sponsored by the National Golf Foundation, honors excellence in golf journalism in local and regional publications and newsletters produced by golf-related organizations.

Fore, entered by Charles Bob, formerly of the Southern California Golf Association in North Hollywood, took first in the quarterly magazine division, while Florida Golfweek, published by Charles Stine of Winter Haven, won in the weekly newspaper category.

Builders honor NGF staff

The National Golf Foundation field services staff has been recognized and officially applauded by the Golf Course Builders Association of America for its efforts in golf facility development. The NGF was recognized for providing "continuous impetus to the development of golf courses in the United States."

Don A. Rossi, executive director of the builders' organization and former NGF executive director, said the award was the first of its kind for the Foundation.

NGF efforts in golf course development began in 1936. Since then, more than 7,000 golf facilities have opened in the United States.

PEOPLE

Cushman's Bozarth dies in North Carolina

John Bozarth, veteran district sales manager for the Cushman Division of OMC Lincoln, died Jan. 2 in Shelby, NC. Bozarth joined OMC Lncoln in 1965 and worked with company-oper-

ated stores for three years before joining the marketing division for Cushman turf equipment.

A former director of the Golf Car Manufacturer's Association, Bozarth was active in several regional turfgrass associations as well as the Elks Lodge.

PESTICIDES

Pesticide info system operational

If your business has a computer terminal with telephone transmission accessories, the National Pesticide Information Retrieval System (NPIRS) is now at your fingertips.

NPIRS is a computer data base resource that describes the key characteristics of the 50,000 pesticides registered with the Environmental Protection Agency as well as thousands of state registrations. EPA cooperates with NPIRS by updating its data weekly, and to date, 12 states have also submitted registration information to the computer system.

Started as a pilot program two years ago, NPIRS went into full operation late last year after a successful test period. NPIRS is a joint program involving Purdue University and the U.S. Department of Agriculture. The USDA, EPA, National Pest Control Association, 12 states and a manufacturer representing the pesticide industry all helped implement the system.

continued on page 16

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LANDSCAPE UPDATE

Restrictions raise nurserymen's ire

According to a National Landscape Association bulletin, Ohio is the most recent state to introduce legislation, which, if enacted would provide the basis for restricting landscape nurserymen from providing landscape design services.

In Ohio, landscape architects are seeking the restricted legislation, citing public health and safety as the need. At the present time, landscape architects and nurserymen in Ohio are negotiating over revised wording which could be supported by both groups.

Canadians study appreticeships

An apprenticeship program for the landscape gardener trade is being established in Alberta, Canada.

The apprenticeship program, under direction of the "Apprenticeship and Trade Certification Branch" of Alberta Manpower is a combination of on-the-job technical training which leads to certification as a qualified journeyman. It involves learning the trade through observation, practice, study and attending technical courses. Apprentices will work under qualified trades people under an agreement between the apprentice and the employer.

The program is still in the development stages, but Ron Oudyk, chairman, Trade Certification Committee LANTA, says the committee hopes to have it implemented for the '84-85 school year.

1984 ALCA Officers Elected *include (left to right) Second Vice President Joe Carpenter, First Vice President Karl Korstad, Vice President-Finance Irvin Dickson, President-elect Rod Bailey, President Landon Reeve IV, Secretary Bruce Hunt, LMD Chairman Jack Mattingly, ILD Chairman Robert Maronde, and Immediate Past President David R. Pinkus.*

GOVERNMENT UPDATE

100 organizations form toxic hazard coalition

Environmental groups, labor unions, and even senior citizen organizations have joined together for a major door-to-door campaign starting this spring to increase the average citizen's "knowledge" about toxic chemicals.

David Dietz, director of the Pesticide Public Policy Forum (3PF) told *Weeds Trees & Turf* more than 13 unions and 55 environmental organizations will participate in the national campaign. Beside knocking on doors across the country, the group is expected to ask for signatures for a petition for tougher chemical laws.

A report on this organization and recent legislation in various states will appear in the May issue.

Ruckelshaus sees little chance for 84 FIFRA without compromise

EPA Administrator William Ruckelshaus has admitted there is little hope for a new set of amendments to the Federal Insecticide Fungicide and Rodenticide Act in 1984, unless both sides work out compromises on their own.

The Harper's Ferry Bill, labelled an environmentalist's want list, was introduced last summer by Representative Harkin of California. The amendments caused the differences between environmentalists and the pesticide industry to grow larger. It is therefore unlikely the two sides will reach any type of compromise this year.

According to an American Association of Nurserymen backgrounder, the Harper's Ferry Bill would require all applicators be certified (not just supervisors), that applicators maintain records of each job, and reduces the use of special local needs registrations. It would also require prenotification, buffer zones, and posting.

Minnesota prenotification bill could crimp pesticide applicators

The Minnesota legislature will be considering a Community Right to Know bill this session which places considerable requirements on all applicators of pesticides. Industry representatives fear the bill, if passed, may be used by other states for similar legislation.

The amendments would require posting 8 1/2 x 11-inch signs five days prior to application stating the pesticide(s) to be used, method of application, date and time of intended applications, known symptoms of the chemicals, name and address of two persons responsible for the application, the address of the Minnesota State Health Department, and the word toxic in two-inch-high letters.

Before making applications copies of pesticide labels are to be provided to the property owner and tenants. Applicators are to send copies of the required materials to the State Department of Health and the State Department of Agriculture.

NPIRS *from page 12*

Jim White, the system's user service manager at Purdue, said the system "fills a long-recognized need. In the past, by the time a compendium of pesticide changes was compiled and issued, it was already out-of-date. Now, NPIRS members can rapidly acquire timely pesticide information."

SOD

Minnesota predicts sod shortage

The Minnesota Turf Association has predicted a severe shortage of cultured sod for the 1984 construction season.

Agronomist Curt Klint, executive director of the Association, said, "Contractors, home builders and other consumers statewide should anticipate their needs early and contact their suppliers to check on availability and prices."

Klint attributed the anticipated shortage as an effect of the construction industry slowdown of the last three years, which reduced the demand for sod. Local turf growers responded to the reduced demand by converting their fields to other crops which allow for harvest every season, instead of the 12 to 18 months needed to produce sod.

Last fall's demand for sod was larger than expected, however, so reserves that would have been available this spring are already depleted, according to Klint.

Sod planted this spring will not be available until mid-1985.

Twin Cities area turf growers supply sod throughout Minnesota, as well as to North and South Dakota, Wyoming, Montana and part of Iowa.

CHEMICALS

Burke elected VP at Stauffer Chemicals

John J. Burke, general manager of Stauffer Chemical Co.'s Agricultural Chemical Division, has been elected a vice president of the corporation.

Burke joined Stauffer in 1966 as an analytical chemist, and he also held several positions with SWS Silicones Corp., a subsidary of Stauffer. A native of Carbondale, PA, Burke received both his bachelor's degree and doctorate in chemistry from the University of Pittsburg.

OLYMPIC Sets the standard for summer and winter color

Olympic lawn in Dallas, Texas, stands out against dormant bermudagrass

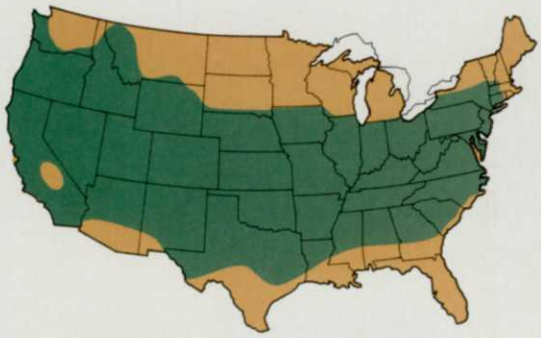
PVP 8100168

OLYMPIC

Olympic turf-type tall fescue takes the 'gold' when greener winter grass is your goal

Before Olympic, the alternative to dormant zoysia, bermuda and St. Augustine grass was Kentucky 31, a coarse pasture grass with drought tolerance. Through years of development, Olympic emerged as a finer leafed, darker green, disease and insect resistant tall fescue that has become the choice for home lawns, athletic fields, sod production and golf courses.

Because of its lengthy root system, Olympic draws moisture from deeper levels, making it an effective water saver for the cost conscious. Its tough, durable surface makes it a natural for playgrounds and parks. Olympic shows terrific shade tolerance too, making it a clear choice for the turf pro who wants to look as good as his turf.



Green shaded area indicates areas Olympic is adapted

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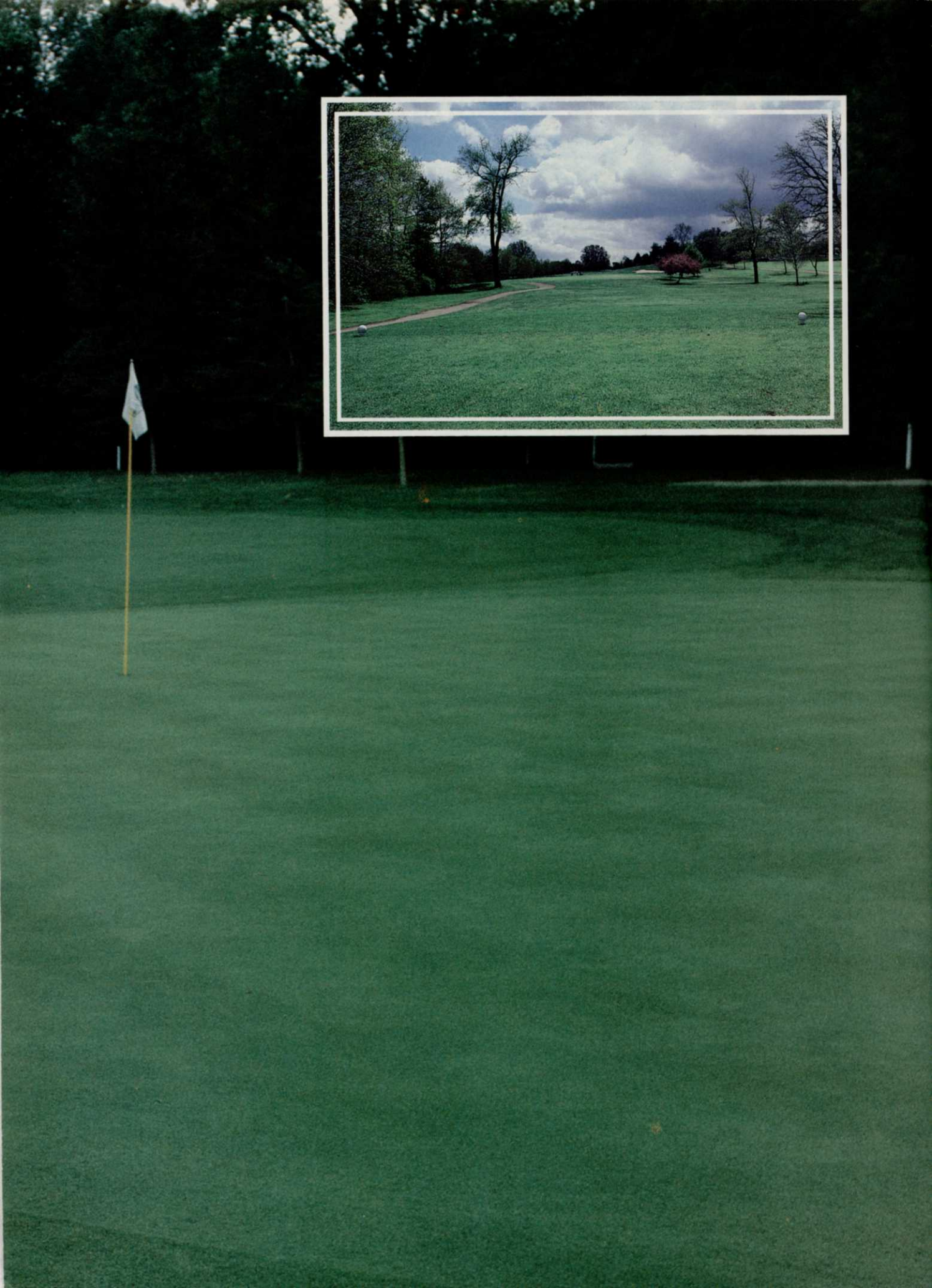


More proof that the best costs less on tees and greens

It's as true this year as it was last.

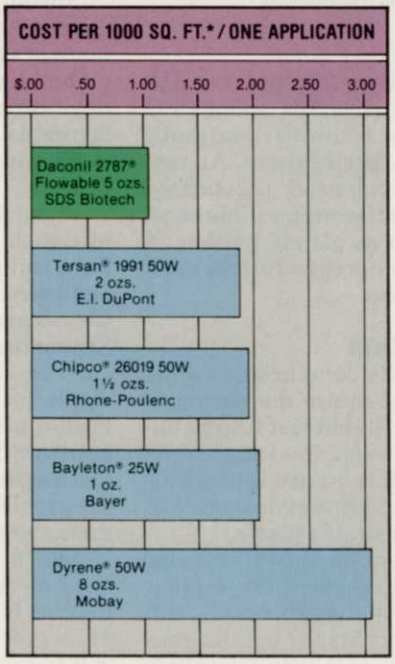
Check the chart of comparative fungicide costs and you'll see for yourself why Daconil 2787 Flowable Fungicide is more economical to use than the other leading products.

Using a typical tee and green spray schedule, Daconil 2787 gives you greater savings on a per 1000 sq. ft. basis when it comes to delivering superior control of your most serious diseases—dollar spot (including benomyl-resistant dollar spot), Helminthosporium (leafspot and melting-out) and large brown patch.

In fact, Daconil 2787 has a proven record of providing the most effective control of 10 major turf diseases.

And here are more reasons why it pays to use Daconil 2787. There's no need to add a costly spreader/sticker. Daconil 2787 already has it built in to assure you of full and even coverage for maximum disease protection.

Daconil 2787 resists wash-off. Which means it keeps on working during heavy rains or watering.



*Costs based on manufacturer suggested retail unit price as of January, 1984.

What's more, in over 15 years of continuous use, there has never been a documented case of resistance with Daconil 2787. Even on courses where it was applied at weekly intervals over many years.

The facts are there. The proof is plain to see. Daconil 2787 gives you both effective and economical disease control.

So this season, make it Daconil 2787 on your tees and greens. Because the best costs less.

Daconil 2787 from SDS Biotech.

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Flowable Fungicide

Always follow label directions carefully when using turf chemicals.

SDS Biotech™

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Circle No. 147 on Reader Inquiry Card

Priorities are a must in May

Setting priorities in May is difficult since so many different things happen at once. Some landscape managers assign crews by a specific type of work, such as insect control, disease control, weed control, and planting. Other managers prefer to assign a portion of the landscape or golf course to crews and let them handle all types of work in the area.

Less skilled seasonal labor generally starts working in May and June. Training these workers becomes an additional consideration.

Certain types of work, especially mixing and applying chemicals, require special knowledge and are not suited for seasonal workers.

The jobs which take special knowledge are irrigation maintenance, selection and use of landscape chemicals, pruning, and equipment repair. Trusting this work to unskilled labor is dangerous.

Irrigation inspection

Irrigation systems should be inspected and tested by May. Considering the cost of irrigation systems and water today, every head, valve, controller, and pump station should be working to specifications. An irrigation system is a carefully balanced, pressurized network. If one part is not performing as intended, other parts will not function as planned either. A novice can't be expected to comprehend all the complexities of an irrigation system.

Chemical considerations

Chemical selection and use is complicated to the point Federal and state laws require the person in charge be trained and tested. It's not just the chemicals that are complicated, it's also the information needed to know when and how to use them. This includes a basic knowledge of primary insects, diseases, and desirable and undesirable plants.

During the end of April and May insects emerge and begin their damage. Warm days trigger chinchbugs, billbugs, webworms, mole crickets, cutworms and various grubs. Preventative applications of turf insecticides are effective at this time. Controlling adult insects before they lay eggs reduces damage later in the season.

Several of the most catastrophic tree and shrub insects attack young foliage in May. Deciduous plant pests include spring and fall cankerworm, elm leaf beetle, honey locust pod gall, eastern tent caterpillar, tussock caterpillar, oak leaf roller, and imported willow leaf beetle. Evergreen and conifer pests active in May include black vine weevil, juniper web worm, and European pine sawfly larvae. Depending on the area, applications of tree and shrub insecticides in early May catch a number of damaging insects at one time.

Early May is an excellent time to apply postemergence herbicides to weeds that escaped preemergence controls. Weeds in their two- to three-leaf stage are most susceptible to postemergence herbicides. Dr. Robert Shearman of the University of Nebraska recommends Trimec or 2,4-DP for postemergence control of hard-to-control weeds such as yellow wood sorrel. Second applications of preemergence herbicides may be needed at this time in northern U.S. and Canada.

Preemergence herbicides should be incorporated into plant beds as you convert from bulbs to annual displays. If beds became excessively weedy in the spring, you may want to spray weeds with Roundup and wait two weeks before replanting. Another option, where practical, is soil fumigation.

Spring rains and warmer temperatures favor development of certain turf diseases. Diseases are more of a concern on specialty turf areas such as golf or bowling greens. But, normal turf areas may develop problems when disease conditions are favorable. See our upcoming Disease Control Guide in the June issue for specific diseases and their control.

Fungicide treatment may be necessary, but factors such as thatch, irrigation, drainage, shade, air flow, soil pH, and fertilization should be examined and corrected to prevent continuing trouble. Schedule necessary renovation work for late August and September.

Tree and shrub diseases abound during May. Apple scab, fireblight, and frog eye begin defacing crabapples. Anthracnose attacks susceptible cultivars of sycamore in May. In both cases, planting disease resistant *Malus* or *Platanus* varieties solves the problem. If this is impractical, fungicide applications should be made in May.

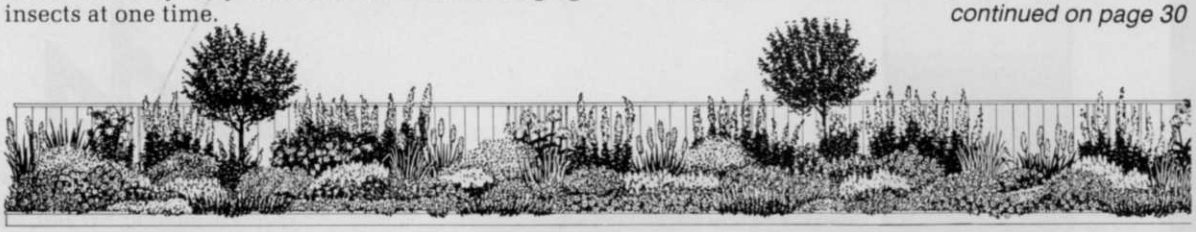
May is a good time to apply growth regulators to hard-to-mow slopes. A new use for growth regulators is annual bluegrass control in turf. 3M's Embark is now registered to discourage *Poa annua* in golf fairways by reducing seed production. Elanco's Cutless, a growth modifier currently under an experimental use permit, appears to have a number of beneficial qualities, including greener turf color.

Aquatic weed control becomes a factor as soon as water temperatures get above 65 degrees F. Lakes and ponds with bad algae reputations should be treated with copper compounds.

A second application of nitrogen to bentgrass, Kentucky bluegrass, zoysia, St. Augustine, and bermudagrass should be planned for mid- to late-May if your program uses quick-release fertilizers.

It is possible to mix compatible pesticides to

continued on page 30



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ORTHENE® Tree & Ornamental Spray is the professional way to kill gypsy moth larvae... plus a wide range of other insects. It kills on contact, then keeps killing with an effective residual action.

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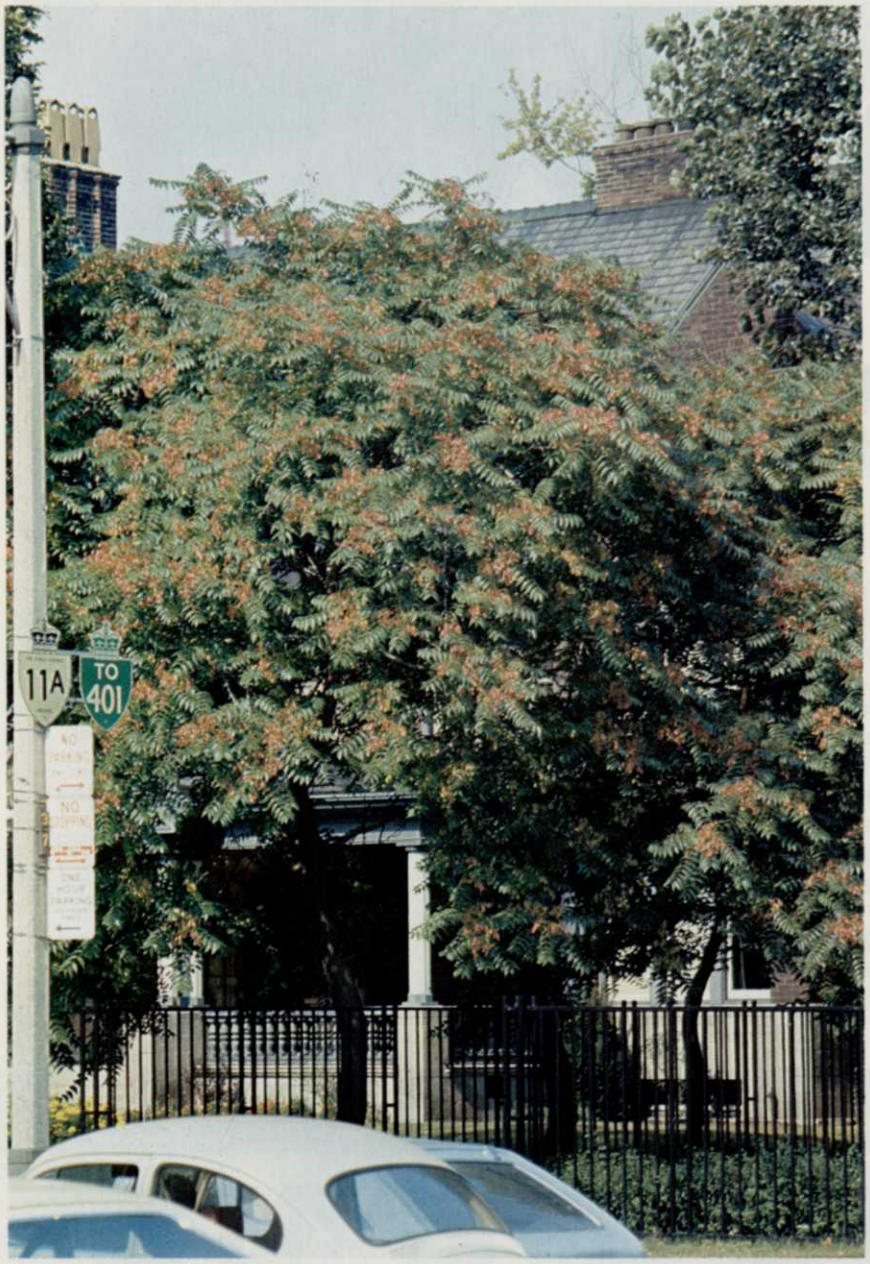
Circle No. 105 on Reader Inquiry Card

Street Trees

We need to constantly rethink and update street tree programs giving emphasis to trees that tolerate urban conditions.

by Douglas J. Chapman, horticulturist-administrator, Dow Gardens, Midland, MI



Tree of heaven *is a short-lived tree tolerant to most urban stresses. However, its value makes its short life worthwhile.*

Trees placed along urban streets are confronted with the harshest macro- and micro-climates possible. They must fit in restricted areas, live in disturbed soil, and be assaulted by salt spray, exhaust fumes, compaction, and even knife-carved graffiti.

As population density increased and man switched from horse-drawn to combustion-engine-vehicles, new problems arose to test the tree's ability to survive.

Trees that worked well when our commercial centers were first developed can no longer take the strain of today's cities. More than 70 percent of our urban centers were developed along rivers and lakes. Rail and highway networks moved cities into new areas.

The average life of trees growing under urban conditions today is 25 to 30 years, not the 100 to 200 years achieved by some trees in their native habitat.

Urban conditions are constantly changing. Likewise, the goals of street tree programs need to be continually adjusted.

By keeping six things in mind, many street tree problems are avoided.

- No species should comprise more than five percent of city trees.
- The backbone of a good street tree program should be based upon native trees.
- Trees selected should adapt well under extreme soil conditions, e.g. low oxygen or wet soils.
- Trees selected should thrive in

DRIVE A DIESEL OVER YOUR LAWN.

It looks like a riding mower. It cuts like a riding mower. But this Kubota is something else.

We call it a Kubota G. You might just call it great. Because it's the first lawn and garden tractor of such remarkably small size to have a diesel engine.

A Kubota G tractor comes with a powerful 2- or 3-cylinder water-cooled diesel engine. The engines are built to the same exacting standards as our bigger tractors. And the advantages of a diesel engine vs. gas are many.

Diesel is thriftier on fuel.

Maintenance is cheaper, too, with no spark plugs, carburetor or distributor to wear out. So you can just concentrate on maintaining your lawn instead of your lawn mower.

Most important, a Kubota diesel will last longer. A good deal longer than any gas mower.

Other big tractor features include a live front PTO shaft drive to the mower. Unlike a belt drive, the shaft can't stretch and is unlikely to break. The result is a smooth, more even cut.

You can also attach a front blade or snow blower. While an optional rear power take-off lets you operate a tiller.

There are four Kubota G lawn and garden tractors, from 10 to 14 horsepower. Two models come with an easy-to-drive hydrostatic transmission.

You can see and drive them all at your nearby Kubota dealer. Just say you want to get behind the wheel of a diesel.

KUBOTA

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conditions of restricted root zones.

■ The ultimate height and habit must fit restricted conditions, e.g. outlawns, utility wires, narrow streets.

■ There is no such thing as bad or weed trees.

History, or hindsight, is often helpful in pointing out short-term errors in judgement and provides a data base to assist us in future development.

Red maples from a Michigan nursery will not do as well as the same trees from local nurseries

The elm is one of many good cases showing monoculture leads to increased problems, insects and diseases in this case. A diverse tree population (no single tree species greater than ten percent of the population) will help reduce the need to control all but catastrophic insect and disease pests.

A good street tree program should be based on the use of native trees. Native trees are usually well adapted to the extreme conditions found in that area. Selecting a number of native tree species is wise for city tree planning.

City foresters and planners should encourage the nursery industry to select, propagate, and sell native plants for their region of the country. In many cases, cities have created their own nurseries to provide replacement trees. The trees in these nurseries should be evaluated for tolerance to modern city conditions and updated.

Trees from similar latitudes around the world should be evaluated for cities. Much of Asia and Eastern Europe is climatically similar to Northern and Northeastern U.S. in terms of temperature, moisture and photo period.

Provenance, or local adaption, is another consideration when planning urban tree programs. Provenance is the adaption of a tree to a particular area.

Red maple (*Acer rubrum*) is found from northern Florida to northern Michigan. But, red maples purchased from a nursery in northern Michigan and planted in northern Florida probably will not do as well as trees from local nurseries. Although the plant is genetically similar, it developed tolerance to conditions slowly as its range spread.

Provenance, carried to its ultimate, can help horticulturists throughout the world select plants for areas of specific rainfall, temperature, soil, and photo period.

Street tree selection means finding trees which tolerate extremes; e.g. disturbed and compacted soil, high water tables, droughty sites.

Some trees during their evolution have adapted to periodic flooding or low oxygen soils. Tolerance to brief periods of stress offers a fertile area for researchers to select cultivars which normally don't flourish under the same stress for longer periods. The ability to tolerate is more important in some instances than aesthetic characteristics.

Several trees are adapted to high water tables. They include Sweet Birch (*Betula lenta*), River Birch (*B. nigra*), Washington Hawthorne (*Crataegus phaenopyrum*), Kentucky Coffeetree (*Gymnocladus dioicus*), Carolina Silverbell (*Halesia carolina*), Swamp White Oak (*Quercus bicolor*), Shingle Oak (*Q. imbricaria*), Basswood (*Tilia*), Boxelder (*Acer negundo*), Red Maple (*Acer rubrum*), and Silver Maple (*A. saccharinum*).Adaption to droughty soils and ability to compete with turf are other major factors when selecting trees for streets. It is important to select plants with the ability to withstand the rigors of hot, dry summers and restricted root zones.

Washington Hawthorne is presently grown as a multiple-stemmed shrub but is equally effective as a small, single-stem tree. It flourishes in harsh conditions. It is relatively tolerant of salt; in fact, we have seen the bark

STREET TREES

Drought Tolerant Species

Acer buergeranum (Trident Maple)
A. campestre (Hedge Maple) (also wet)
Ailanthus altissima (Tree of Heaven) (also wet)
Carya ovata (Shagbark Hickory)
Catalpa spp. (catalpa)
Cornus kousa (Kousa Dogwood)
Corylus colurna (Turkish Filbert)
Crataegus spp. (hawthorn) (also wet)
Elaeagnus angustifolia (Russian Olive)
Ginkgo biloba (Ginkgo) (also wet)
Gymnocladus dioicus (Kentucky Coffeetree) (also wet)
Koelreutaria paniculata (Goldenraintree)
Malus spp. (crab apple) (also wet)
Nyssa sylvatica (Black Gum)
Quercus alba (White Oak)
Q. macrocarpa (Bur Oak)
Robinia pseudoacacia (Black Locust)
Sophora japonica (Japanese Pagodatree)

High Clay/Low Oxygen Soils

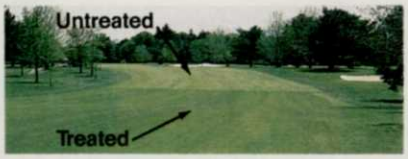
Acer campestre (Hedge Maple)
A. griseum (Paperbark Maple)
A. negundo (boxelder)
A. platanoides (Norway Maple)
A. rubrum (Red Maple)
A. saccharinum (Silver Maple)
Aesculus hippocastanum (Common Horsechestnut)
Ailanthus altissima (Tree of Heaven) (also dry)
Alnus glutinosa (European Alder)
Betula lenta (Sweet Birch)
B. nigra (River Birch)
Carpinus caroliniana (American Hornbeam)
Celtis occidentalis (Common Hackberry)
Cercidiphyllum japonicum (Katsuratree)
Crataegus spp. (hawthorn) (also dry)
Fraxinus americana (White Ash)
F. pennsylvanica (Green Ash)
Ginkgo biloba (Ginkgo)
Gleditsia triacanthos inermis (Thornless Common Honeylocust)
Gymnocladus dioicus (Kentucky Coffeetree) (also dry)
Halesia carolina (Carolina Silverbell)
Juglans nigra (Black Walnut)
Liquidambar styraciflua (American Sweetgum)
Malus spp. (crab apple) (also dry)
Ostrya virginiana (American Hophornbeam)
Platanus acerifolia (London Planetree)
P. occidentalis (American Planetree)
Prunus serrulata spp. (Oriental Cherry)
Quercus bicolor (Swamp White Oak)
Q. coccinea (Scarlet Oak)
Q. imbricaria (Shingle Oak)
Q. palustris (Pin Oak)
Q. robur (English Oak)
Q. rubra (Red Oak)
Tilia americana (Basswood)

Put down the *Poa annua* seedhead uprising before it starts. Use Embark® PGR.

Tame *Poa annua* while it's young. Or it will grow to become a rebellious turfgrass, producing stiff seedheads that don't mow well, turning fairways oyster-white or a pale yellow, discoloring shoes, irritating allergies and generally making golfers uneasy. Not to mention course directors.

However, a little Embark PGR (Plant Growth Regulator) applied early in the growing season will keep *Poa* in its place.

Just one-half pint per acre arrests *Poa* seedhead development. And by preventing seedheads, root



systems are strengthened, summer vigor is increased, summer color is enhanced and early discoloration is minimized.

The result is a uniform, dense, attractive and long-lasting playing surface.

Embark PGR also controls the growth of other grasses. Use it to reduce mowing frequency on slopes, around trees and creeks, and other hard-to-maintain areas. Saves manhours and wear on mowing equipment.

Now you can also buy Embark PGR in quart containers, and at a dramatically new low price.

For more information, contact Agricultural Products/3M, 223-1N, 3M Center, St. Paul, MN 55144. Or see your local 3M Embark PGR distributor.

3M Hears You...

3M

Circle No. 129 on Reader Inquiry Card

literally encrusted with salt and yet the plant survives.

Kentucky Coffeetree is a large tree, reaching 60 to 70 feet in height, with a grotesque growth habit that is, in fact, beautiful. It is extremely tolerant of urban conditions.

Swamp White Oak and Shingle Oak are natives that adapt to low oxygen soils. Their infrequent use is sometimes associated with difficulty in growing and transplanting.

Several plants thrive in droughty soil. They include Shagbark Hickory (*Carya ovata*), Hackberry (*Celtis*), Northern Catalpa (*Catalpa speciosa*), Kentucky Coffeetree, Hophornbeam (*Ostrya*), Bur Oak (*Quercus macrocarpa*), and Black Locust (*Robinia pseudoacacia*). Each of these have a unique niche to fill.The total size of the tree dictates the amount of outlawn required to sustain it. Trees should be classified as small (under 25 feet), medium (25 to 50 feet), and large (more than 50 feet). As urban areas become more densely populated, outlawns are narrower and street trees may need to be smaller than the towering elms of before.

Trees which survive so well they are often considered weeds should be reevaluated. For example, two maples have received bad reputations, red maple and silver maple. They are rapidly-growing native trees with few insect and disease problems. Regional cultivars of these maples could cause a resurgence in the use of these trees.

We must continually select, breed, and transplant trees with the objective of increased longevity, realizing that a great number of trees will not survive beyond 15 to 25 years. Tree of Heaven (*Ailanthus altissima*) and Boxelder (*Acer negundo*) are tolerant, but short-lived trees for urban areas. Tolerance to urban conditions should be of paramount importance while still trying to select trees with increased longevity. **WT&T**

TREE HEIGHTS

30 to 50 feet

- Sweet Birch
- River Birch
- Northern Catalpa
- Washington Hawthorn
- Carolina Silverbell
- Hophornbeam
- Shingle Oak
- Boxelder
- Black Locust
- Hackberry

50 feet and above

- Shagbark Hickory
- Kentucky Coffeetree
- Swamp White Oak
- Basswood
- Red Maple
- Silver Maple
- Bur Oak

Keep grass from chewing up your mowing budget. Spray Embark® PGR.

Keep the time spent mowing and trimming around trees, stones, fences, ponds, and other hard-to-reach areas — plus those long stretches of open grass — from feeding on your maintenance budget.

Spray a little Embark® PGR (Plant Growth Regulator) and slow the growth of most turfgrasses for at least 6 weeks, while your grass retains a healthy green appearance. This dramatically extends the time between mowings, so you can spend valuable manhours on other tasks.

What's more, it typically now costs less to spray Embark PGR than to mow one time. And it can be sprayed over an area in about one-sixth of the time it takes to mow.

Take advantage of Embark PGR in parks and golf courses, on roadsides and airports, or wherever else you want to save the time and cost of mowing.

Embark PGR is now available at dramatically reduced prices: $27/quart and $79/gallon* (one gallon covers 5⅓ acres).

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*Suggested retail price.

3M Hears You...

3M

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BIG CHIPPER

PROMARK MODEL 210 BRUSH CHIPPER

The rugged, heavy-duty portable chipper specially designed for the professional arborist, landscaper, maintenance supervisor, and rental equipment operator.

What they are saying about Promark 210 Model Brush Chipper:

RENTAL YARD
"We were amazed! We've tried other chippers in the past—Large units were expensive and costly to maintain, but smaller units did not have the rental appeal. Now, we're renting the Promark '210' at a rate we never guessed was possible."

TREE CONTRACTOR
"As a small tree contractor that found the Promark '210' ideal for our situation, we felt it was very economical to operate and still had the capacity to do what we needed."

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Circle No. 140 on Reader Inquiry Card

MAY *from page 22*

Prune back shrubs *after flowering by removing older stems instead of shearing for shape.*

reduce the number of separate applications. For example, premixed combinations of ornamental insecticides and fungicides are available. Turf fertilizers and herbicides are often combined as well. Ask your chemical supplier for premixed products when available or about compatibility of the products you want to mix.

Prune after flowering

May is a good time to prune overgrown forsythia, quince and some spireas as soon after blooming as possible. Pruning these plants back later in the year or during the winter will reduce the number of flower buds. Correct pruning usually involves thinning out branches rather than shearing these plants back to shape. Rhododendrons and azaleas can be lightly pruned following flowering. Experts recommend removing seedheads as they form after flowering.

Take notes to remind you later of changes needed in landscape design or major pruning. It's always a good idea to carry a small notebook with you to make such notes.

Set equipment priorities

To cut equipment down time, check spare part supplies and insist operators check belts, hydraulic lines, oil and filters at least twice each day. Establish priorities for jobs so equipment can be moved to high priority work in the case of breakdowns. Call your parts supplier before sending a crewmember to pick them up. It may be cheaper to pay a delivery service than take a man off a job to pick up supplies. **WT&T**

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Of course, if all that still hasn't sold you on the idea of three wheels instead of four, here's something else to think about.

For the price of the last pickup you bought, you could've bought a lot more than just one Yamahauler.

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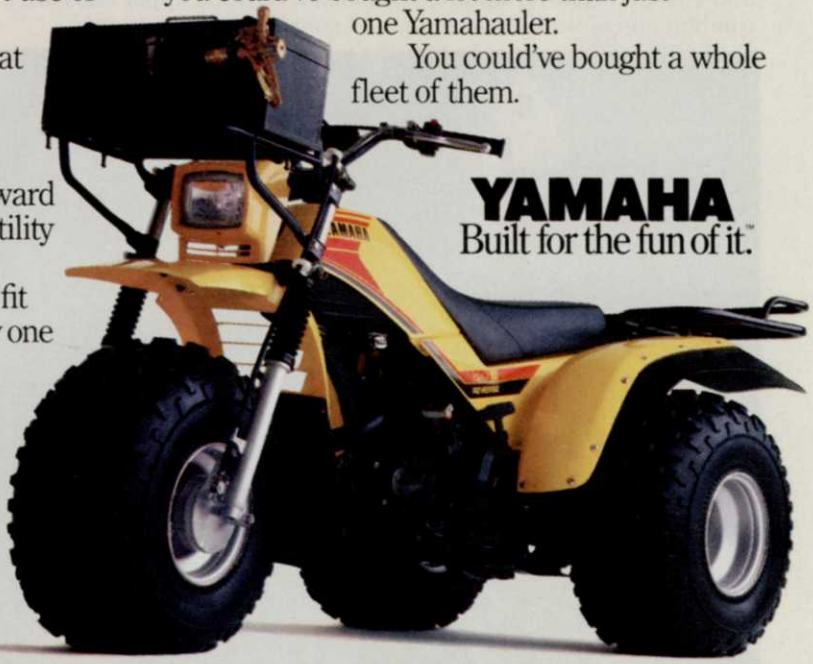

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Circle No. 158 on Reader Inquiry Card

Winter Damage

Cold temperatures this winter struck normally temperate regions of the South causing widespread damage.

by Michael A. Dirr, associate professor, horticulture, University of Georgia, Athens, GA

Snow insulates lower buds *of rhododendron while upper buds are killed by a combination of wind desiccation and poor acclimation to cold.*

Forsythia buds *above the snow line are often killed by cold temperatures. Vegetative buds, however, survive and leaves develop normally.*

Expect considerable flower bud damage and stem dieback on deciduous and broadleaf evergreen shrubs this spring. The damage will be pronounced from Minnesota to Florida.

In Minneapolis-St. Paul lows ranged from -30 to -34 degrees F. In Athens, GA, the mercury fell to 3 degrees F.

In both locations, similar temperatures have been recorded in previous years. Unfortunately, this year the plants were not fully acclimated and had not reached their maximum cold tolerances when the December freeze hit.

Additionally, the low temperatures persisted which accentuated the degree of injury. Plant exposure to prolonged low temperatures is usually more serious than short-term exposure (several hours).

Cold acclimation

Cold acclimation occurs in two stages, the first being triggered by short days in late summer and fall. The second stage is triggered by repeated exposure to low temperatures as well as freeze/thaw cycles.

It is obvious from the temperature data for the Athens area, that the plants never received the necessary low temperatures.

The same was true for Minnesota, where Dr. Harold Pellett at the University of Minnesota Landscape Arboretum reported flowers buds of the Northern

Subdue. The most effective fungicide against Pythium blight and damping-off.

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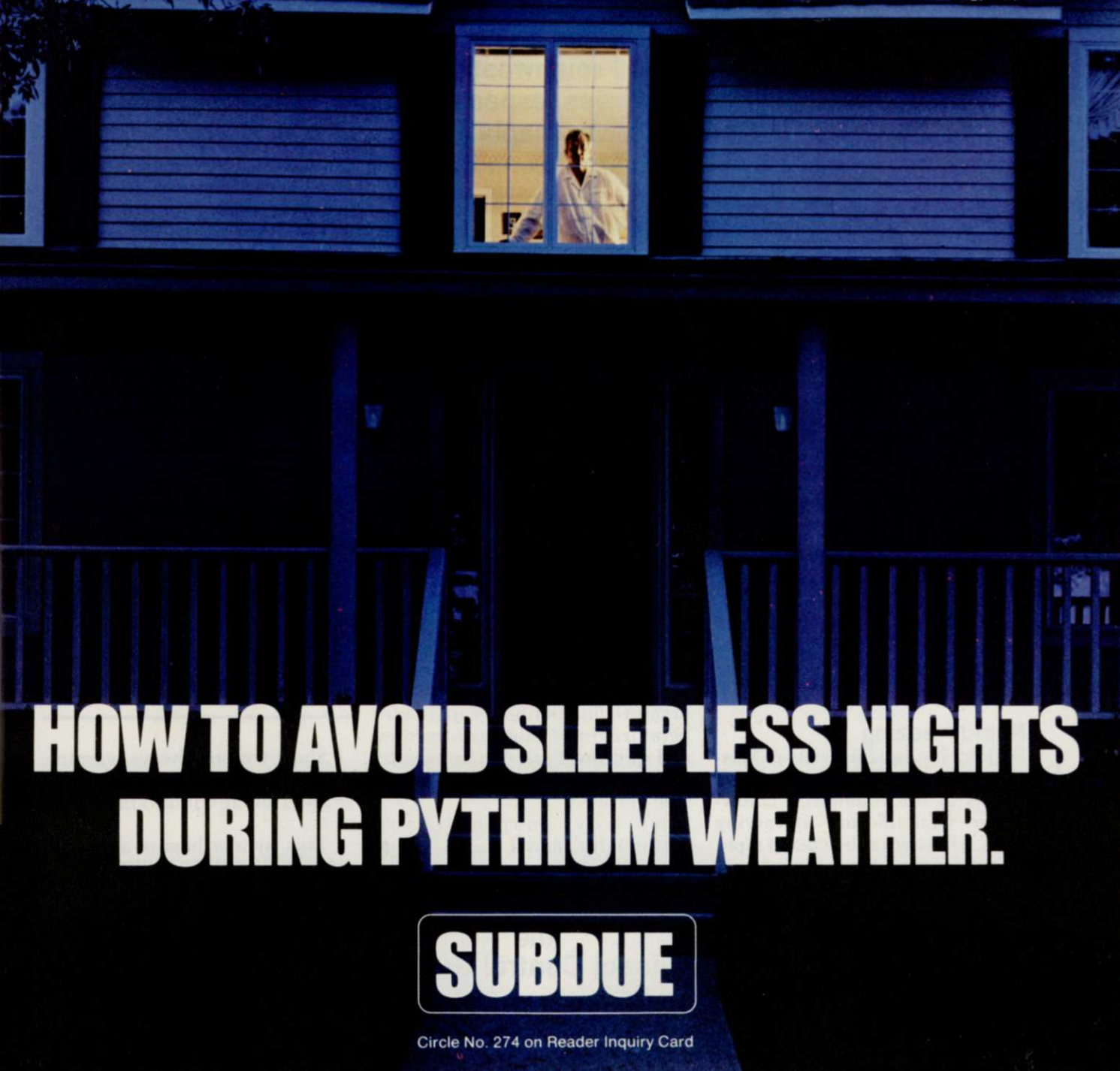

HOW TO AVOID SLEEPLESS NIGHTS DURING PYTHIUM WEATHER.

SUBDUE

Circle No. 274 on Reader Inquiry Card

Lights hybrid azaleas were killed. These azaleas were bred and selected for flower bud cold tolerance down to -45 degrees F. But, the plants did not acclimate and, consequently, flower buds were killed.

Forsythia buds are often killed by low temperatures. Flower buds will open below the snow line where they are insulated. Notice that the vegetative buds are seldom injured and the leaves develop normally. This points out that flower buds are more susceptible to low temperatures than vegetative buds.

The Rhododendron Society rates various cultivars by their *flower bud hardiness*. H-1 is cold hardy to -25 degrees, H-3 to -5 degrees, H-5 to 15 degrees, and H-7 to 32 degrees F.

Dehydrating winds

Coupled with low temperatures were dehydrating winds. The wind passing across a leaf or stem surface acts as a driving force to remove water (via transpiration) from the tissue. If water is removed from leaves faster than it is replaced, cells will die.

Flower buds are more susceptible to low temperatures than vegetative buds.

Additionally, if the soil is frozen, roots cannot absorb water and the injury is even greater.

In general, broadleaf evergreens were more severely injured than deciduous plants. Plants shielded from the wind suffer less winter damage.

Rapid freezing

Dr. John Havis, University of Massachusetts, has frozen and thawed leaves of *Rhododendron catawbiense* 'Grandiflorum' at varying rates. All leaves subjected to rapid freezing were killed. Slow freezing, rapid and slow thawing did not result in injury.

Rapid freezing probably does not occur frequently in nature. Dr. Pellett has measured plant tissue that was 20 to 25 degrees F. warmer than the air temperature on bright, sunny days. When a cloud passes overhead there is a rapid plunge in air temperature that results in the death of some cells. Over time, the cumulative effect is yellowish to brownish foliage.

This type of injury results in the poor winter color of *Thuga occidentalis*, American arborvitae, many junipers, other needle and broadleaf evergreens.

Nurserymen have selected away from this characteristic to provide Techny and Nigra arborvitaes which maintain dark green through the winter. Wintergreen Korean boxwood (*Boxus microphylla koreana*) maintains good green foliage color while the Korean form turns sickly brown.

Frost cracks are most common on the south and southwest sides of trees, especially Norway maple and London plane tree.

Location and frost cracks

Proper siting of plants in the landscape can literally save lives or at least preserve foliage color. Controlled studies in Kansas and Minnesota have proven plants perform best on north, northeast and northwest exposures where temperatue fluctuations in winter were reduced and summer temperatures were relatively cool. The south and southwest exposures were the worst.

Bark splitting and frost cracks may also result from great temperature fluctuations. Rapid temperature drops cause contraction and splitting. Frost cracks usually occur on the south or southwest side of trees.

Norway maple (*Acer platanoides*) and London plane tree (*Platanus x acerifolia*) are particularly susceptible to frost cracking. Other species also experience this phenomenon to various degrees. The best remedy is to plant non-frost cracking species.

Winter protection comes in many forms, but the most logical is the use of plants that are *perfectly* cold hardy in your area. Invariably, plants are used outside their zones of adaptability and suffer from cold "come-uppance". Gardenia is sold and planted in Zone 8 (10 to 20 degrees F.) but invariably is killed to the ground as it was in 1981-1982 and this year. In fact, plants look so bad this year, they may not resprout from the base.

Plants can be protected with burlap, boards, plastic structures, etc. Nurserymen protect their container plants by storing them in plastic covered houses. In the production phase this is acceptable but in a landscape situation it is almost impossible.

To prevent snow and ice damage on yews, boxwood and other plants that tend to split, tie branches with string, wrap in burlap, or build a protective cover.

Anti-desiccants (films) have been used with variable success on evergreens. The idea is to cut down on water loss through the leaves. Repeated applications through the winter might improve results compared to a single late fall application.

Readers are encouraged to write the magazine about their experiences with winter kill this year.

Since we are always learning, I'd appreciate observations from readers about winter kill in their area.

This article begins a regular series in WEEDS TREES & TURF on plant identification and problems. You may reach me by writing the magazine, 7500 Old Oak Blvd., Middleburg Heights, OH 44130. Let me know what you'd like to discuss. **WT&T**

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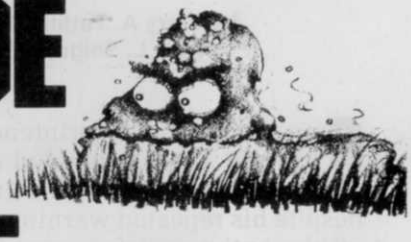

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Circle No. 136 on Reader Inquiry Card

Mower Wounds KILL TREES

Seemingly small bumps or scrapes by mowers can cause severe damage to valuable shade trees. Operators need to understand what mower injuries do.

by Terry A. Tattar, Associate Professor of Plant Pathology, University of Massachusetts, Amherst, and
Alex L. Shigo, Chief Scientist, Forestry Science Laboratory, USDA Forest Service, Durham, N.H.

One golf course superintendent in New York, frustrated over continued wounding of trees despite his repeated warning, laid off the entire mowing crew for a day. He no longer has serious tree wound problems from lawnmowers.

Lawnmowers are often operated by people with little or no training in arboriculture. They do not understand injury and infection started by lawnmower wounds can often be the most serious threat to tree health on golf courses, parks, and other landscapes.

Most arborists and tree pathologists have been aware of the lawnmower problem for some time. Extensive research has been conducted on the importance of wounds in tree health care (Shigo 1977. 1979). This research has led to significant adjustments in pruning, cabling, bracing, injection, and cavity treatment (Shigo 1982).

Despite this knowledge, one major source of wounds, lawnmowers, remains a constant threat to tree health care (Tattar, 1978).

Lawnmowers cause the most severe injury during periods when tree bark is most likely to "slip", in early spring during leaf emergence and in early fall during leaf drop. If the bark slips, a large wound is produced from even minor injuries.

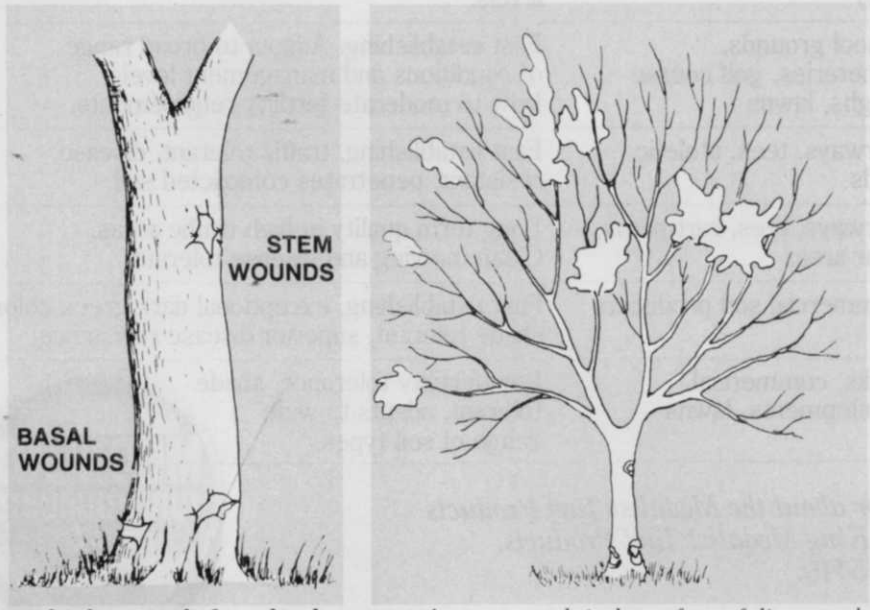
Most tree injuries occur when mower operators attempt to trim grass around trunks with a push or riding mower. This can be prevented by removal of turf around trees or hand trimming.

The site of injury is usually the root buttress, since it flares out from the trunk and gets in the path of the mower. However, injury is also common anywhere from the roots to several feet above the ground.

Although large wounds are most serious, repeated small wounds can also add up to trouble.

Wounds from lawnmowers are serious enough by themselves, but the wounded tree must also protect itself from pathogens that invade the wound. These microorganisms can often attack the injured bark and invade the adjacent healthy tissues, greatly enlarging the affected area. Sometimes, trees can be completely girdled from microbial attack following lawnmower wounds.

Decay fungi also become active on the wound surface and structural deterioration of the woody tissues beneath the wound will often occur. Many wounded trees which are not girdled may eventually break off at the stem or root collar due to internal decay.



Multiple wounds from landscape equipment *result in loss of tree foliage and eventual death.*

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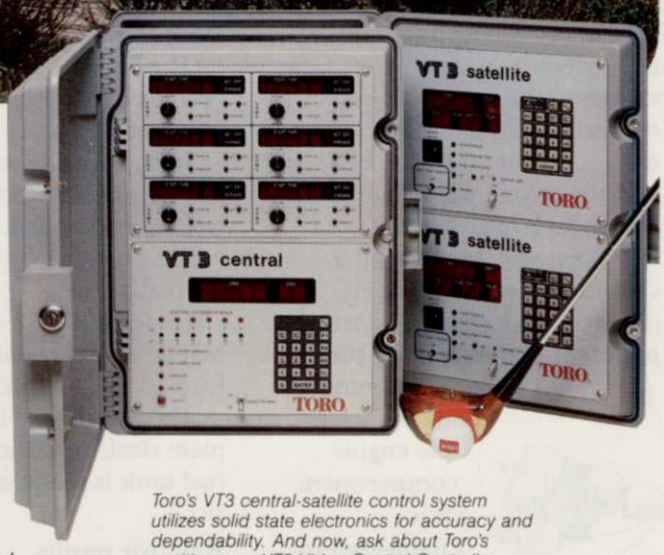

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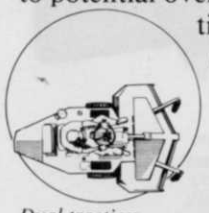

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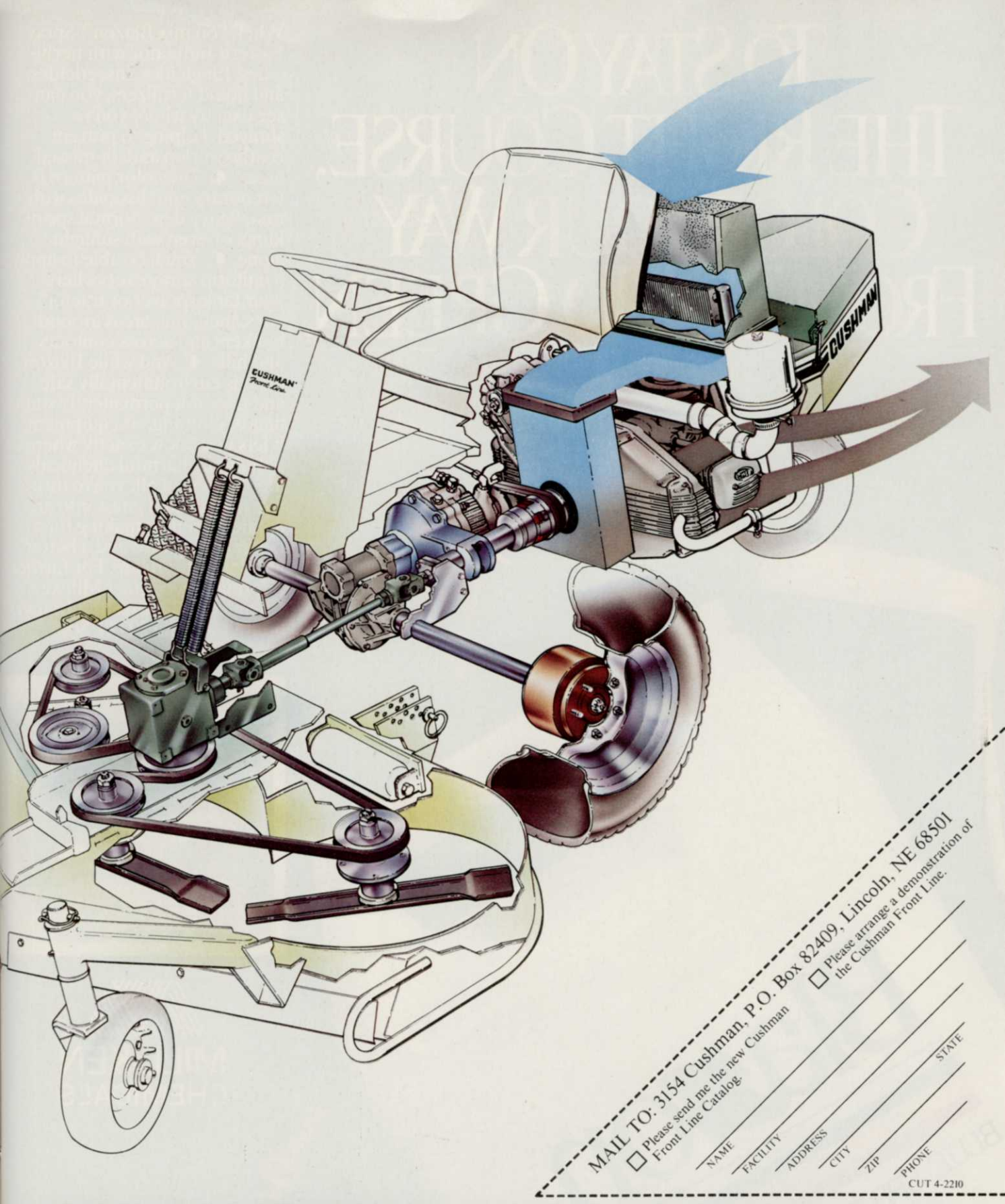

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The lawnmower injury problem in not a tree problem, but a people problem.

Injury treatment

Bark can often be successfully reattached to trees if the wounds are treated within a few hours after injury occurs. Torn bark should be positioned as much as possible in its exact position before the injury and held in place by a few small tacks or staples.

If several days or weeks have passed since the injury, torn or loose bark should be cut away and the edges of the wound should be traced using a hand tool such as a pruning knife.

Pruning tools should be sterilized between trees. There is no need to cut additional tissue around the wound to achieve a certain shape. Avoid making deep scribes or any vertical sharp points which serve as additional sites for bark dieback and starting points for bark cracks.

Older injuries with callus development all around the wound are best left alone. If any bark around old wounds is dead it is advisable to trace the area back to live bark. Application of wound dressing for cosmetic purposes is optional. **WT&T**

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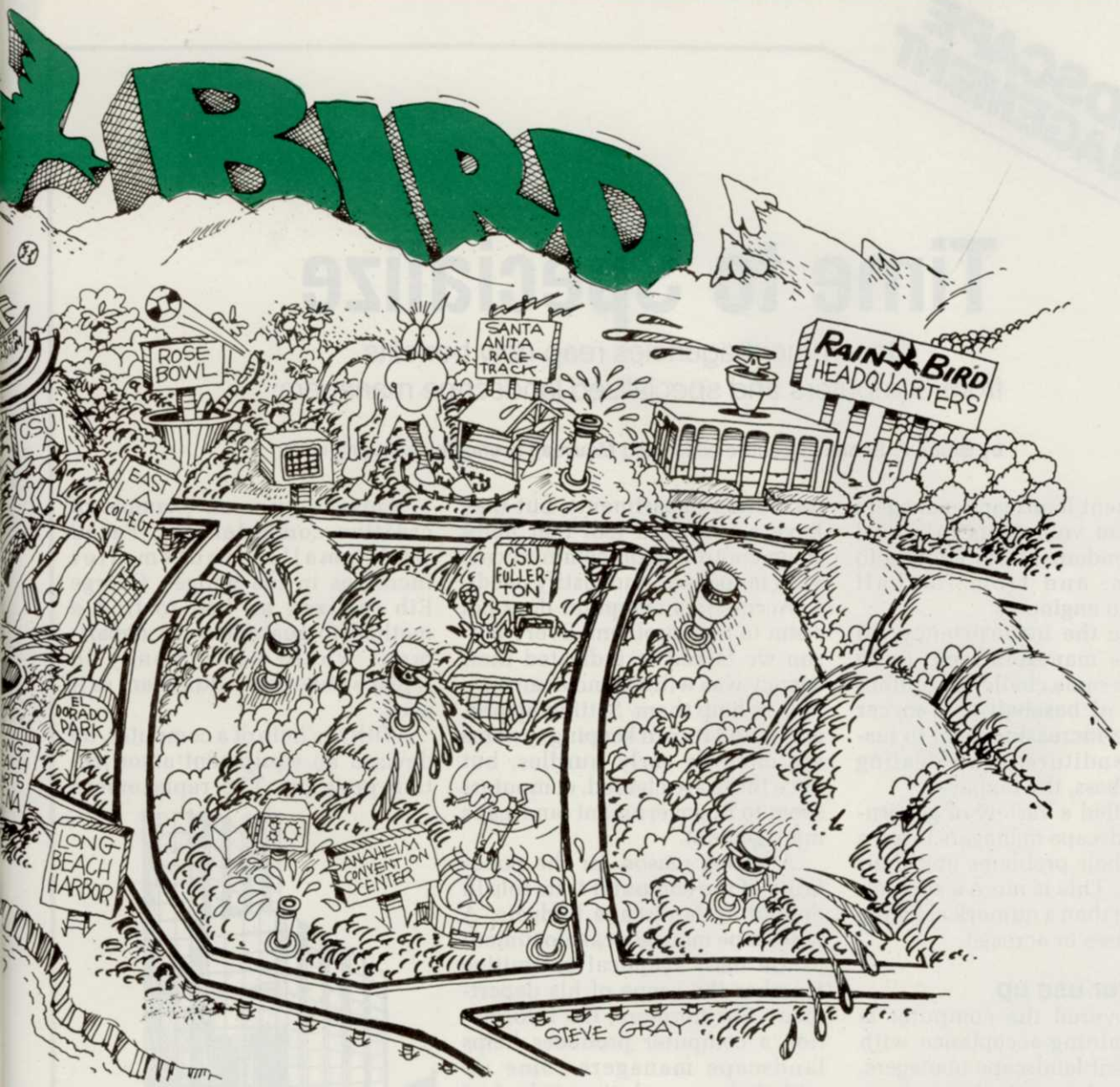

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Circle No. 142 on Reader Inquiry Card

LANDSCAPE MANAGEMENT

Time to Specialize

Government agencies reap new benefits from computers and specialized landscape managers.

by Bruce F. Shank, executive editor, and **Maureen Hrehocik,** managing editor

Government landscape managers range from volunteers to school superintendents, from janitors to generals, and from football coaches to engineers.

Despite the inconsistency, all landscape managers seem to be facing the same challenges; intensive use of baseball and soccer fields, the increasing need to justify expenditures, and dealing with the boss, the taxpayer.

We polled a variety of government landscape managers to get a feel for their problems and their solutions. This is more a slice-of-life report than a numerical listing of purchases or acreage.

Computer use up

We discovered the computer is rapidly gaining acceptance with government landscape managers. They are using computers to keep track of trees, equipment repair parts, scheduling, and to keep taxpayers posted on department activities.

Community size doesn't seem to matter. Eric Anspaugh, superintendent of Kettering, OH, parks, and George Eib, superintendent of forestry and landscaping for Kansas City, MO, both use computers.

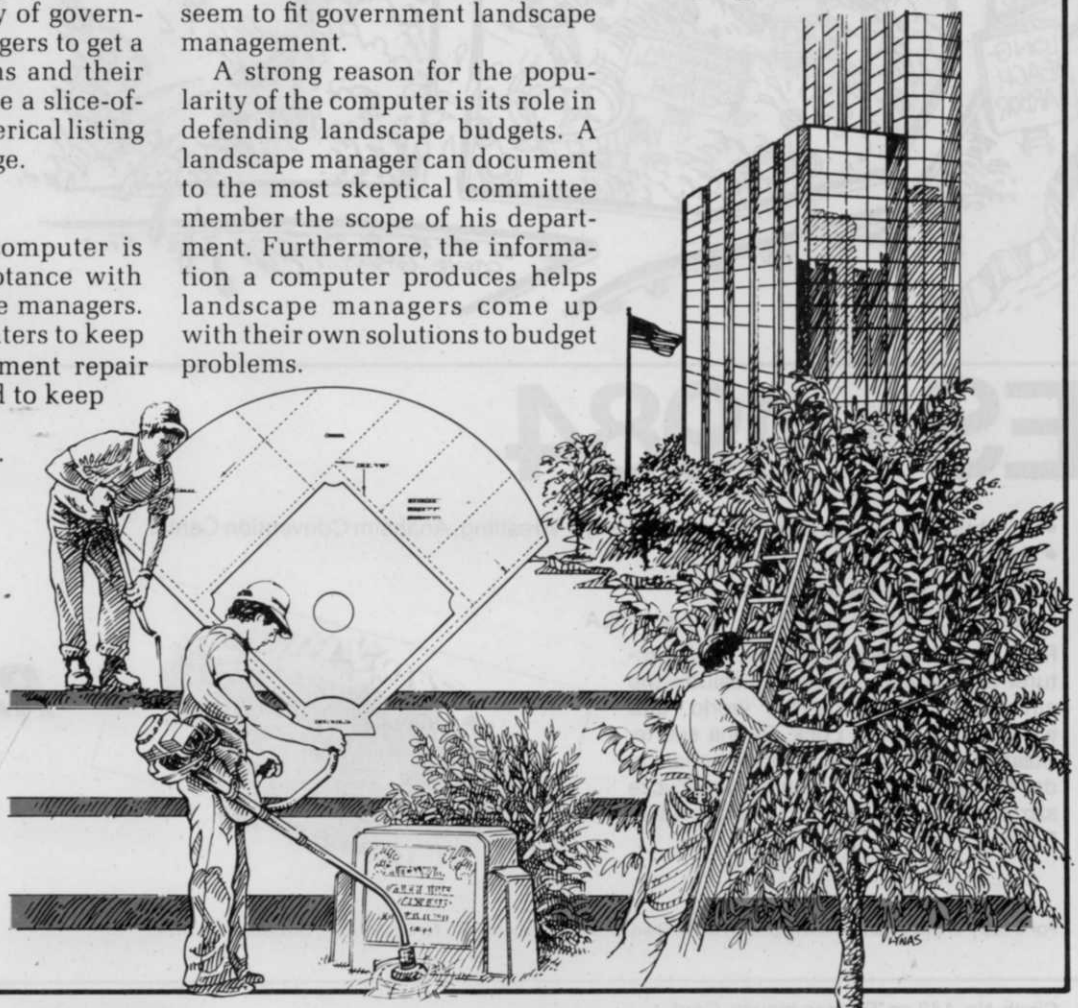
Landscape managers may have to share computer time with the street recreation departments, but they have access to a tool that helps them control labor, communicate with taxpayers, and justify needs.

Access to a computer does not seem to be a problem. Every person we talked to indicated their agency was willing and even anxious to help them. Setting up programs and record keeping systems are cited as early hurdles, but once these are cleared, computers seem to fit government landscape management.

A strong reason for the popularity of the computer is its role in defending landscape budgets. A landscape manager can document to the most skeptical committee member the scope of his department. Furthermore, the information a computer produces helps landscape managers come up with their own solutions to budget problems.

Kansas City is an example of creative computer use. Faced with smaller and smaller increases in his budget, George Eib realized he had to find a method to guarantee his department would have money to replace important equipment as it aged.

With the help of a computer, he devised an equipment amortization program. The replacement



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value of key equipment (trucks, cars, mowers, etc.) is divided by its useful life. This amount is built into his budget each year and placed into an equipment replacement account. Eib does not have to make a capital expenditure request each time a piece of equipment needs to be replaced. It paid off this year when Kansas City froze Eib's budget.

Kettering's Anspaugh is lucky to have funds from a recent income tax increase in this city south of Dayton. Nevertheless, with the help of a computer he has documented the cost of maintaining each of 33 baseball fields under his care. Armed with this information, it's easier to win financial support from leagues using the fields. During summer leagues his crew has to drag and reline nearly 30 fields each day. When leagues ask for fancier dugouts or bullpens, he has the data to negotiate.

Specialization

Many of the battles with boards can be eliminated when public agencies recognize the special knowledge and needs of landscape managers and provide them with a more direct link to decision makers.

Lenoir, NC, has specialized all city landscape needs into a single department whose manager reports directly to the city manager.

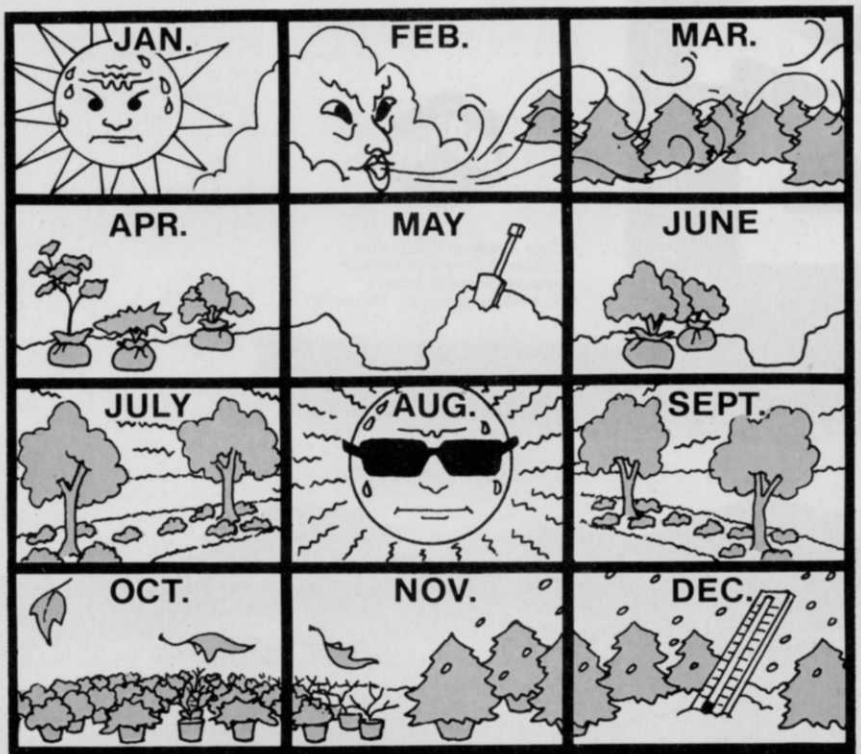
John Abernethy, the first person to be certified by the Professional Grounds Management Society in 1981, is the landscape superintendent in Lenoir, an important furniture manufacturing center. "My department does many of the things public works and recreational departments normally do," he explains. "We take care of street trees, cemeteries, athletic fields, and parks, and plant 4,000 tulips and 6,000 annuals each year around the city. The advantage is I go directly to the city manager when I need something, not a citizen committee."

"Recreation and public works departments simply don't understand what's needed to properly care for public landscapes. They tend to look at landscape maintenance as an area to cut when budgets get tight. It's much easier to explain the biological needs of plants to one person than a group," Abernethy stated.

Specialization plays an important role at the U.S. Military Academy at West Point, NY. All pest control, from mice to weeds, is the responsibility of Theodore Copertino. His crew of seven controls weeds, diseases, structural pests, and outdoor pests from nematodes to gypsy moth.

This specialization gives John Nosick, head of maintenance, time to focus on facility mainte-

continued on page 88



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LANDSCAPE MANAGEMENT

The parks maintenance department in Oak Ridge, TN, encourages citizens and workers to grade its work.

Report Card for Parks

by Maureen Hrehocik, managing editor

One of the picturesque flower gardens *in Jackson Square.*

Not too many maintenance departments receive comments about their maintenance practices from the public, that is unless they make an all-out effort to solicit them.

The parks department of the City of Oak Ridge, TN, has done just that, and the results have shown a "dramatic" increase in productivity as well as quality of work.

Bill Sewell, director of recreation and parks and Larry Bailey, parks superintendent are behind the project that lets citizens grade the landscape upkeep of the city's buildings and facilities, athletic fields, community parks and flower gardens.

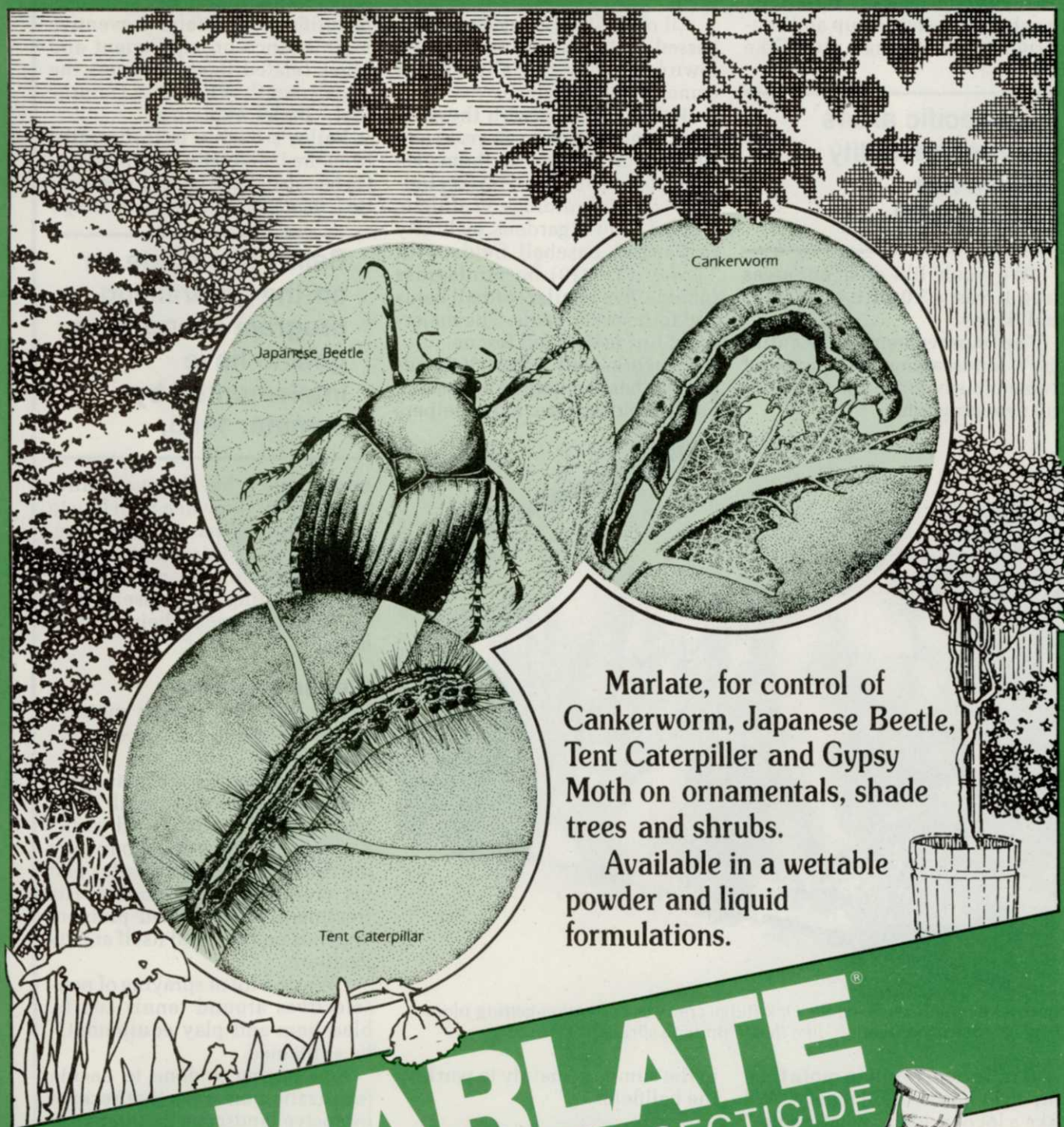
"What we found is that our personnel began to look at their work more than just a job and more as a personal responsibility because they knew the citizens of the town would be looking carefully at what they did," said Bailey. "Their specific areas of responsibility improved dramatically."

Bailey has taken the concept one step further. The employees also grade their work.

"They're their own worst critics," he said.

Bailey, 36, has devised a comprehensive 81-page grading manual with guidelines and photographs of "acceptable" and "unacceptable" levels of mainte-

Control!



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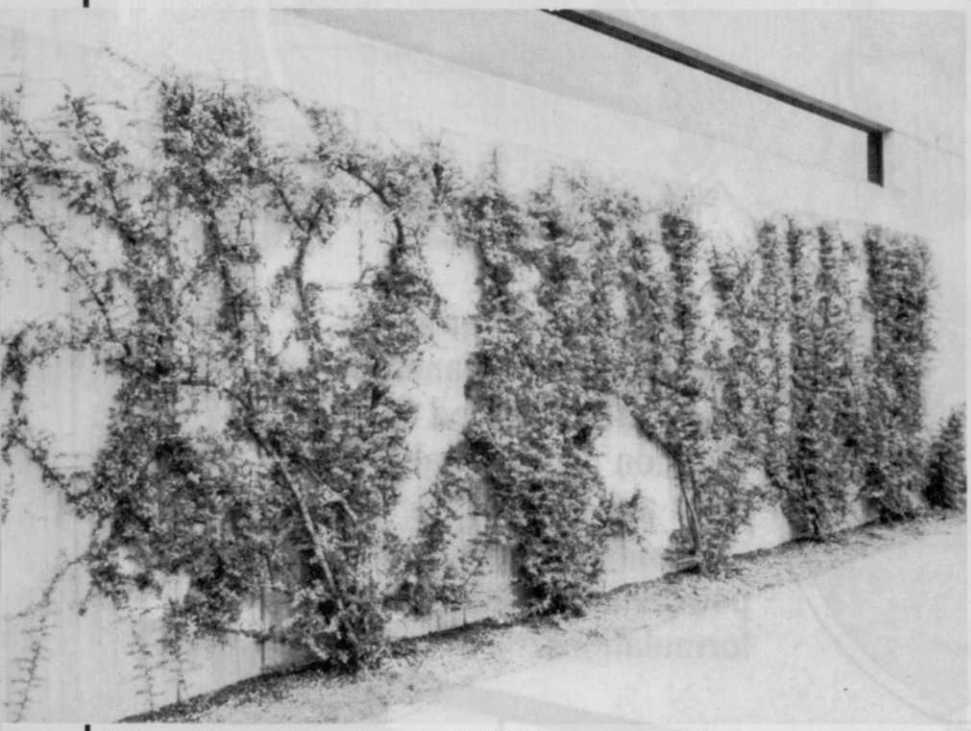
nance in certain areas. The areas are then given checks. At the end, the checks are tallied up and converted to a percentage, much like in school.

... specific areas of responsibility improved dramatically.

"We would like all of our areas to be at least a 3.0 (on a 4.0 scale)," said Bailey.

The improvement to the entire city's landscaping has improved tremendously since the outset of the new program.



Spurred by public review, *the Oak Ridge crews use attention-getting plant displays for extra attention, like these climbing shrubs.*

"We're here to put in more than our eight hours," said Bailey. "We take a lot of pride in what we do."

Energy center

Oak Ridge with a population of about 29,000, is a major energy center.

During World War II, the atom bomb that destroyed Hiroshima was developed in Oak Ridge. It had a population then of 75,000 and was considered a "boom town."

All of the flurry has long since passed, but a commitment to the town hasn't — especially when it comes to maintenance.

Bailey has been with the division of recreation for 13 years and supervisor for six of them. He oversees 1,100 acres of turf including 15 public buildings, 12 athletic fields, 12 flower gardens, eight city parks, two baseball fields with Tifway (T- 419) bermudagrass infields, five regular softball fields and four soccer fields. The majority of turf is K-31 tall fescue.

He works with a $194,399 budget and has the help of 6.5 people year-round and two extra helpers in the summer, mainly to work on the ballfields.

Training is goal

Bailey is very concerned about the training of his employees and has made developing an on-the-job training program a long-term goal to have implemented by summer, 1985.

"I'd like to acquire video tapes and other audio-video presentations related to grounds maintenance, athletic field maintenance, beautification, safety, preventive maintenance on equipment and other related topics and use the department's VCR as a training tool," Bailey explained.

Bailey's degree is in Forestry from the University of Tennessee. He has also taken short courses on turf management and landscape maintenance, but the availability of taking his crewmen with him to such seminars, hasn't been there.

Bailey has made an on-the-job training program a long-term goal to have implemented by summer 1985.

"I'm hoping this will give us an opportunity to offer our employees something very essential to the performance of their duties," he said.

Weeds & insects

Bailey says his biggest maintenance headaches are weeds and pest control.

Chickweed, dandelions, nutsedge, crowsfoot, annual bluegrass, henbit, kudzu, wild garlic, plantain, purslane and ground ivy are the weeds that give Bailey and his crews the most trouble. His treatment for the weed problem depends on the weed itself and its location.

"We do a lot of spraying of nonselectives around tennis courts, bleachers and play equipment," he explained.

Soil testing is done to decide fertilization on areas that receive intensive landscape maintenance which would include athletic fields, flower gardens and the grounds around public buildings.

For the past few years he has had an increasing problem with Japanese beetles.

"At first we started setting traps out for them, but they didn't

continued on page 92

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Circle No. 162 on Reader Inquiry Card

Arlington Cemetery

Maintaining a national landmark takes a combination of horticultural expertise and a respect for the ritual and prestige of the nation's most renowned cemetery.

by Maureen Hrehocik, managing editor

Dihle used to use a high boom sprayer *but found wind carried away fertilizer to non-selected areas and the vehicle sometimes hit the top of tombstones. He has since gone to a short boom sprayer with off-center nozzles which shoots the chemical into the next row of headstones.*

The rain continued to fall at Arlington National Cemetery on a chilly February morning.

In the distance, the sharp crack of guns saluted a deceased Air Force officer. A bugle droned a dreary "Taps." The rain-drenched caisson that brought the casket to the gravesite stood idly on the side of the road.

Another Arlington funeral with "full honors."

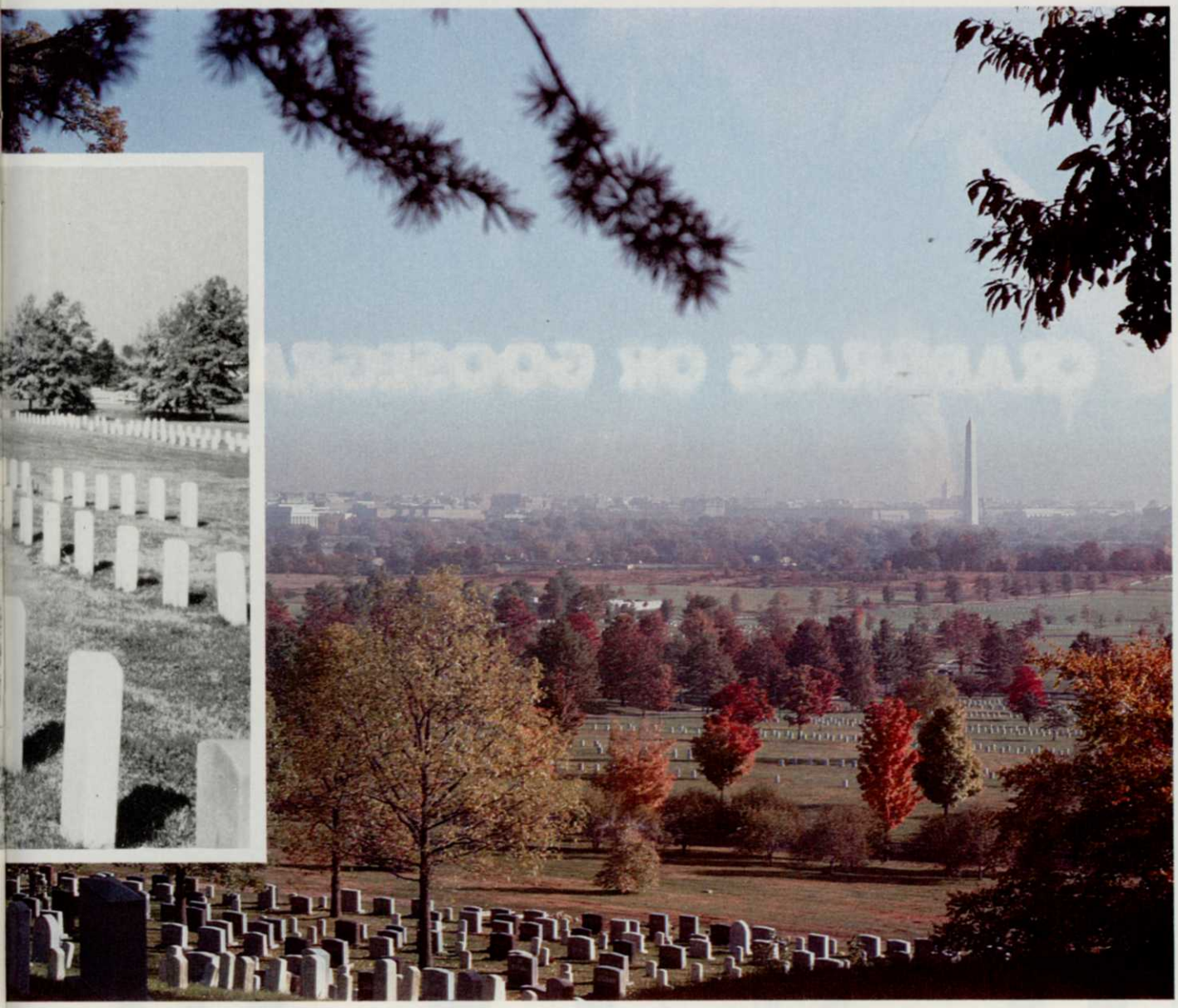
Just one more of the 15 that will take place that day; just one of the 4,000 interments that will take place in Arlington this year. Another white marble headstone among the 190,000 already there.

Behind all the pomp and ritual of every Arlington burial is a 25-person landscape staff, headed by horticulturist Erik Dihle, that understands the needs and requirements of landscaping the 500 acres in the country's most well-known cemetery and landmark. It doesn't matter that many burials disturb roots of trees hundreds of years old among the cemetery's 9,000 causing severe damage to some. Or that compaction is a problem with all the vehicle traffic around the grounds. Or that maintenence must be scheduled around frequent burials or visits ranging from heads of state to Boy Scout troops.

It doesn't stop at knowing just what tree to plant where or just what height the grass should be mowed or what herbicide will take care of certain weed problems. It's an understanding that ceremony at Arlington comes first, and everything else, including routine, necessary grounds care, must be squeezed in-between.

"We never really reach a level of turf we would like to main-

Horticulturist Erik Dihle *stands in front of the Tomb of the Unknown Soldier overlooking the Mall, one of the high maintenance areas at Arlington National Cemetery.*



A serene view of two of the nation's most prestigious landmarks — *Arlington National Cemetery and the Washington Monument.*

tain," said Dihle. "Arlington is a very active place with lots going on every day. Also, because Arlington is so prestigious, lots of tact must be used in dealing with the public."

Dihle said groups come in such as the survivors of Pearl Harbor or POW groups and want to do memorial tree plantings.

"We're always ready to assist where we can," Dihle said.

Add to that the fact that Arlington National Cemetery is also a tourist attraction with the grave of President John Kennedy and the Tomb of the Unknown Soldier attracting thousands of international visitors yearly.

Ceremony at Arlington comes first with everything else, including grounds maintenance, squeezed in-between.

Kennedy's grave, the Mall in front of the Tomb of the Unknown Soldier and the Memorial Amphitheater are high maintenance areas because of their high visibility.

Arboretum setting

Weed control is a top priority, along with turf and tree care.

"We are in the second year of a three year weed control program and are very pleased with the results," said Dihle. "We've practically eradicated our broadleaf weeds. We try to renovate 15 to 20

continued on page 56

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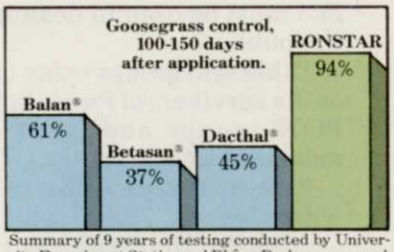

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acres each year with Roundup."

The overall landscape effect of Arlington is a natural, woodland-like setting. Its 3,000 shrubs and hedges are not manicured into sculptured balls or boxes. They are kept neat, but natural looking. The cemetery has more than 9,000 trees scattered among the rows and rows of headstones. Three hundred to 400 are pruned each year. Six crewmen work six months a year just pruning small trees and shrubs.

In fact, Dihle points out, if Arlington wasn't a cemetery, it would be a beautiful arboretum. On its grounds is the largest Post oak in Washington, D.C., the Arlington oak. It's protected from lightning with wire terminals attached to the end of its branches and grounded. Magnolias, weeping cherries, hickories, cedar, oak, maple, elm and crabapple dot the cemetery. Dihle would like to get rid of the oaks (which comprise 1/4 of the trees) because of the potential for gypsy moth problems.

"We lose about 25 to 30 trees annually and plant about 80 large (3.5 to 5 inch) caliper trees a year," he said. "I'd like to start adding more variety to what we have."

He is also concerned that the many trees that were part of the original estate where the cemetery now is, are preserved.

"Many of these trees cannot be replaced in our lifetime," he said.

The overall landscape effect of Arlington is a natural,woodland-like setting.

Dihle has an older, high pressure tree sprayer that uses a needle for feeding with products such as Davey's Arbor Green. His primary sprayer is a Root-app, a drill-like gun sprayer that pounds into the soil like a jackhammer and injects a measured amount of fertilizer. One crew member works full-time nine months out of the year feeding trees.

"Tree feeding is an ongoing project for us except in the fall," Dihle said.

300 truckfulls of leaves

Leaf collection during November and December is one of the largest maintenance jobs. This, along with mowing, are two areas contracted out in a $900,000 contract.

During those peak leaf collection months, Dihle estimates the 30 to 35 full-time people working collect about 300, 20 cu. ft. truckloads full of leaves. The two percent leaf removal the regular Arlington grounds staff does is ground and mixed with sewage sludge from the city and used as a topdressing.

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The next time you want to know something in the green industry, give them a call. If you can't reach them at the office, don't worry. They'll reach you in the pages of ***WEEDS TREES & TURF.***

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A GREAT MEDIUM TO GROW PROFITS IN.

A crewman feeds one of the *9,000 trees on the cemetery grounds.*

Lancaster Landscapes of Virginia holds the cemetery's mowing contract on its mainly bluegrass/fescue turf. According to Dihle, the company uses largely Gravely, Heckendorn and Jacobsen rotary mowers, cutting an average height of 2.5 to 3 inches.

"I like to cut the grass a little higher because it helps in moisture retention," explained Dihle. "Only 100 acres of the cemetery are irrigated - around the Kennedy gravesite, Mall and Memorial Amphitheater."

There's also a need for a mower with good flotation because of the "corduroy effect" settling graves have on the surface of the turf.

"The graves settle and as the mowers go across they have a tendency to scalp. That's why we need equipment with good flotation."

The hillside behind the Kennedy grave going up to the Arlington House mansion is a par-

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Circle No. 168

ticularly difficult landscape maintenance problem. Because it is behind the Kennedy grave, it must be given careful attention.

"We have a hard time keeping it green," said Dihle. "If we irrigate it, the water collects and floods out at the bottom. Because it's so steep, most mowers have a hard time making the grade."

They've found a National 84-inch triplex mower does the best job because of its lower center of gravity.

Trimming around the 190,000, 24-inch high headstones is done once a week, by hand, with Bunton trimmers.

"We used to use a soil sterilant around the headstones, but it turned the grass brown which is unsightly, so we went back to trimming," said Dihle.

Turf spraying used to be done with a high boom sprayer to clear the 24-inch headstones. The spray, though, since the sprayer was so high off the ground, was being windblown to other areas. Dihle now uses a short boom with off-center nozzles which can spray into the next row. The white marble headstones were also being discolored when limestone was applied.

Arlington National Cemetery, unlike other national cemeteries, is under the Dept. of the Army.

"We switched to pelletized limestone which we can shoot into the next row as well," he said.

Dihle is trying to get away from the bar-type tires on most of the department's vehicles.

"I'd like to get more turf-type tires on our equipment to minimize damage and compaction." A three-point hitch Cyclone spreader is used for fertilizing.

Gearing up for Memorial Day

About 37,000 square yards of sod are used a year, mostly around graves.

There are several pesticide projects going on each week such as spraying for American Holly leaf miners and spraying for aphids. Five acres are under contract for spraying including the Kennedy grave and the administration building.

This month Dihle and his crew will be involved in spraying elms, tree planting, shade tree pruning, in-house pruning of ornamentals, preparation of flower beds for planting around the Memorial Amphitheater. High maintenance turf care will begin at the Kennedy grave, Mall and administra-

continued on page 94

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LANDSCAPE MANAGEMENT

The "Second" Mission

Keeping the grounds of the Johnson Space Center in top flight condition takes streamlined planning and patience with fickle Houston-area weather.

In the course of a year, Ray Meyer has had to deal with hurricanes, record-breaking cold temperatures, an inordinant amount of rain, drought and a deer problem.

As the management agronomist for the Lyndon B. Johnson Space Center in Houston, Meyer has the added responsibility, in the face of what Mother Nature dishes out, of keeping the 1,595 acres of the jewel of NASA's space program in "perfect" condition.

While the JSC's first mission may be training astronauts and undertaking space missions, public relations is its "second mission"; providing the two million visitors who flock to the site every year, a pleasing and attractive physical plant along with the latest display in extraterrestrial hardware.

"The Johnson Space Center has really become somewhat of a national landmark."

"The Johnson Space Center has really become somewhat of a national landmark and must be maintained as one," said Meyer.

Uncooperative weather

That, sometimes, is easier said than done.

Last August, a hurricane hit Houston and totally uprooted 600 trees. Another 650 were blown over so badly they had to be staked. Of the staked trees, Meyer said he only lost about 10 percent.

"The other 600 that were totally uprooted, we had to cut up."

Last December, nature struck again. This time it was below normal freezing temperatures.

"I still don't know the extent of that damage," Meyer told WEEDS TREES & TURF. "It will probably take the better part of the spring to tell what's going to green-up and what's not."

In February, Meyer was battling deer. He spotted as many as 68 eating and trampling plants on the complex.

"Most of the crew has been working 14 hour days trying to net them and carry them away from the Center."

And then there's the rain.

Average rainfall in Houston is from 50 to 60 inches. When it rains, it usually pours, causing flooding and severe runoff problems.

"On the other hand, we have to deal with drought during some seasons as well," he said.

As management agronomist for the past five years, Meyer is responsible for all 1,595 acres, including 600 acres with the highest visibility, 920 secondary acres at the Center and 75 NASA-occupied acres at Ellington Air Force Base North of the JSC.

"I'm employed by NASA to manage the grounds contract," explained Meyer. "Our maintenance work is contracted out to Chemical and Vegetation Control, Inc. in Baytown."

Ray Meyer, *management agronomist for the JSC for the past five years.*

The grounds care budget is around $1 million.

"That really isn't as high as it may seem when you consider the standards we're expected to keep," says Meyer, who earned degrees in ornamental horticulture and forestry at the University of Missouri and completed his MBA degree from the University of Houston at Clear Lake in December.

Simple, efficient landscaping *and use of native Texas plants and trees are hallmarks of the Johnson Space Center. Water lilies and fish in ponds add beauty as well as keep algae under control.*

Controlling costs

Meyer said that those standards aren't maintained simply by spending money.

"Part of the job," he says, "Is seeing that all of the funds made available to us are spent wisely and efficiently. We find ways to stretch our financial resources and our manpower."

The grounds care budget is around $1 million.

Some of those ways, Meyer said, is purchasing more efficient equipment, using slow release fertilizers and improved chemicals.

"We now have 10 Toro Groundsmaster 72s and a Howard-Price Hydro-80 (15-foot mower) that really suit our needs well. We've also increased our mobility by using Cushman trucksters to get around."

Meyer explained when he first came to the JSC it took 12 people five weeks to mow the entire complex. Now, with the more efficient equipment, it takes seven people three days.

Turf at the JSC is divided into three classes. Class A turf is highly maintained and manicured. It surrounds most buildings and visitor areas and is mowed weekly. Class B turf receives moderate care and is found beside roads. Class C is the turf in fields most distant from main public areas. The latter two classes, Meyer says, "are mowed less frequently with most fields being mowed only once yearly. In some areas we let it go to six inches before taking off 50 percent of the foliage." The growth rate is roughly 1.5 inches a week.

"I've also changed to slow release fertilizers and now only have to fertilize twice a year instead of four or five times. We have very alkaline soil which we're trying to make more acidic. By using sulfur-coated urea, we're accomplishing that and avoiding an extra pass over the fields for sulfur application. Doing it this way saves us both time and money in the long-run."

Soil tests performed yearly by Texas A&M University, determine his soil needs.

Meyer maintains that Roundup is his favorite herbicide. Where a long-residual non-selective is needed, he uses Krovar and Spike.

Meyer saves expense and effort by using growth retardants.

"Much of the weed control work quite simply wouldn't be done, at least not at the level we're doing it, without the help of chemicals," he said.

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An aerial view *of the expansive NASA Johnson Space Center in Houston, encompassing 1,596 acres of developed and undeveloped land.*

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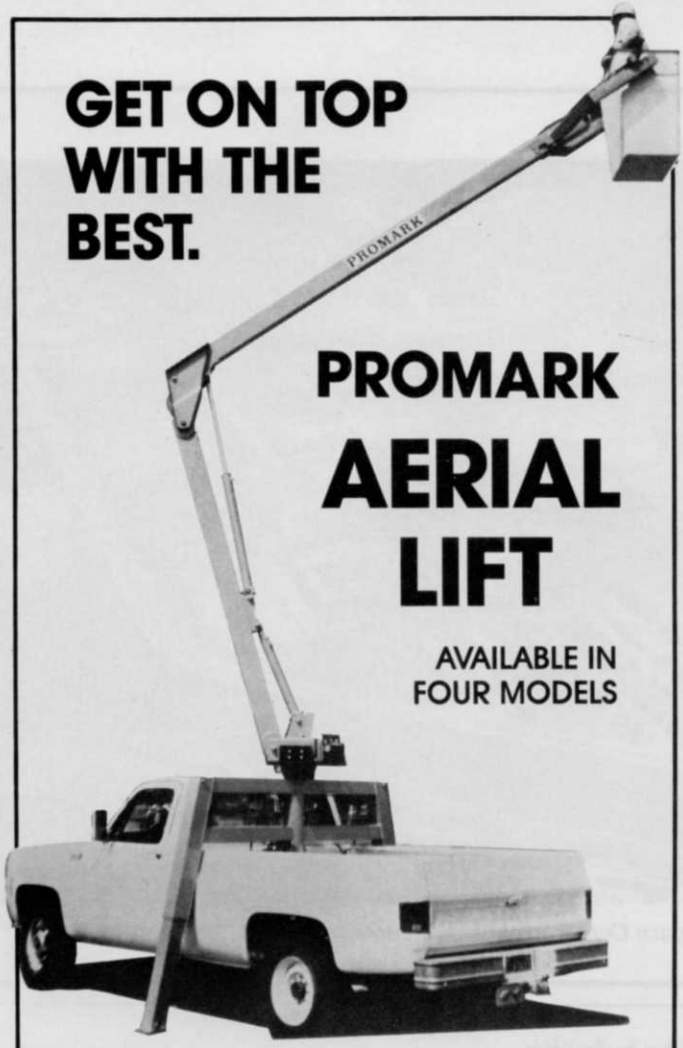

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Meyer usually has the contractor apply around 100 gallons of Roundup yearly to enable a "very intensive weed control job to be done for about half the cost of manual labor."

"One of our major weed problems is dallisgrass, but we also use Roundup to control encroaching St. Augustine and bermudagrass as well as for edging and renovating," he said.

Another herbicide Meyer uses is MSMA, which plays an important role in a practice Meyer believes should be more widespread.

"Where possible," he explains, "I try to turn a tough weed problem into an asset by incorporating that plant into my program. For example, in one area where we would normally want to have our 'premium' grass, St. Augustine, we've stopped fighting encroaching bermudagrass. Now we favor bermuda in that area."

Meyer also saves expense and effort by using growth retardants and limiting his mowing program to what's absolutely necessary.

"We apply Embark on turf along sidewalks and the site's street curbs. Atrinal is usually applied once in the spring to shrubs and hedges.

"I've found Mavrik Aquaflow to be one of the best insecticides on the market. It's very concentrated, doesn't smell and is very efficient. It costs more initially, but in the long-run, it is less expensive to apply and lasts longer," said Meyer.

Flowers and fish

Before Meyer became responsible for maintenance, the several ornamental ponds at the Center were cleaned once or twice yearly.

"That involved opening the drains and cleaning them by using fire hoses," he said. "Now the ponds are stocked with water lilies and various species of goldfish (carp).

"The water lilies make the ponds look attractive and the fish eat sufficient quantities of algae to keep it from getting out of hand.

People don't mind seeing a little leaf cover on the bottom — and I'm sure don't mind saving the $12,000 a year we were spending on algicides ... not to mention the money and time we're saving, by cutting out some useless work."

Meyer is in the first year of a 5-year renovation plan. Plans are to add wildflowers, native trees and shrubs, and stone mulch.

Irrigation, too, is only done on an as-needed basis. Much of Houston's rain comes in heavy downpours.

"Since I've been here, we've had two rains of 18 inches or more. We've also had some very dry periods," said Meyer. "Despite those ups and downs, however, we've managed to maintain a reasonable irrigation program that meets better-than-the minimum needs of our plants without excessively damaging the budget."

Down the road

Meyer is in the first year of a 5-year plan that calls for the renovating the landscapes of all 48 buildings on the site.

He has also started a native Texas wildflower program.

"We've planted 12 acres of 1,200 acres available to us with bluebonnets, the state flower of Texas. They're low maintenance and add a lot to the beauty of the grounds."

The most common trees on site now are live oak, slash pine and sycamores. Fairly common are cyprus, red maples, water oak, willow oak and yaupon. Other species Meyer would like to see on the grounds are spruce pine, sand pine, Italian stone pine, mesquite, Texas mountain laurel, Chinese pistachio and sugar maple. The latter, he says, will grow "quite well here, but not many people try planting it."

Last year he bought primarily Parkinsonia, Chinese pistachio and mesquite and about 3,000 shrubs - mostly dwarf Nadina, dwarf Indian hawthorne, dwarf abelia, azaleas, several varieties of junipers, cotoneaster, Japanese boxwood and dwarf yaupon. Most of the shrubs' new homes are in already-established ornamental beds. Others, though, will be used to replace honeysuckle beds throughout the site which became badly infested with weeds. For attractive cover in this area, he uses stonebark, a volcanic rock.

"I bought 60 tons of the rock and it was worth every penny because of what it will save on manpower in years to come," he commented. **WT&T**

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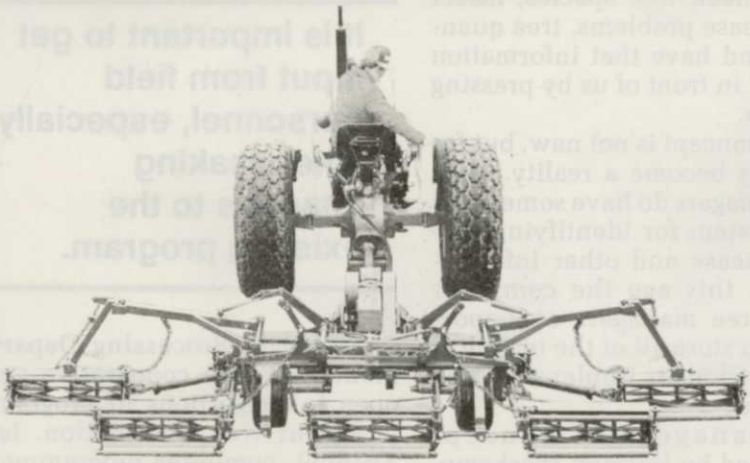

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Circle No. 104 on Reader Inquiry Card

Going Computer

Computerized records help park superintendent with planning, budgets and reports.

by Ed Porter, parks superintendent, La Verne, CA

Having kept tree records for administrative purposes for several years, the parks department staff felt it was about time we improved our tree management operation and utilized a computer.

The potential was intriguing. While sitting in the office, we could check tree species, insect and disease problems, tree quantities, and have that information visually in front of us by pressing a button.

The concept is not new, but for us it has become a reality. Most tree managers do have some technical system for identifying species, disease and other information. In this age the computer offers tree managers an opportunity to store all of the technical data needed to implement tree programs.

A management concept developed by Herman Weskamp, Professor of Urban Forestry, at Mount San Antonio College, Walnut, CA, gave us the motivation to initiate a computer tree program for the City of La Verne.

In order to even consider having a tree program, a need must exist. If that need is present, then that is your starting point. The expense of a computer can be very costly but, in our case, we were fortunate enough to have an IBM System 34 Computer. One of the biggest hurdles facing us was convincing Administration of the justification. Much to our surprise, Administration was very enthusiastic and receptive of the idea.

It is important to get input from field personnel, especially when making changes to the existing program.

The Data Processing Department was very cooperative and open to suggestions in programming our tree information. Jay Trunnel, computer programmer, discussed with us at great lengths the type of information needed in setting up a program. It is as important for the programmer to understand your goals, objectives, and purpose as it is for you, as a novice, to understand what he can do for you. Cooperation of both departments is a must.

continued on page 86

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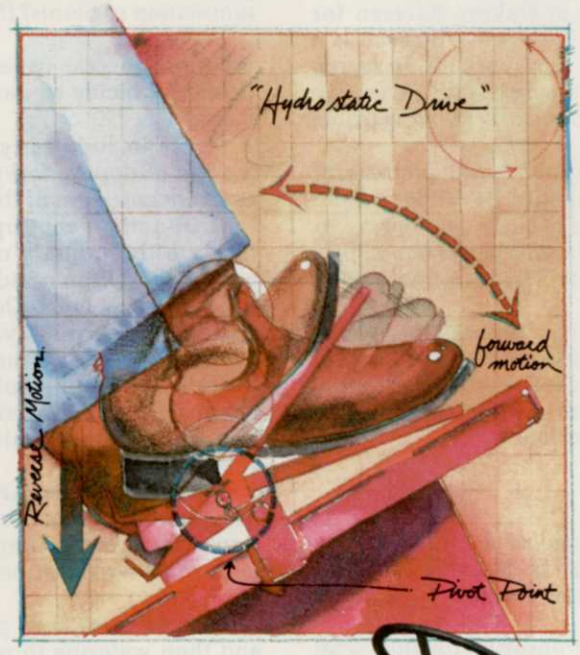

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Circle No. 152 on Reader Inquiry Card

PROBLEM SOLVERS

by **Balakrishna Rao,** Ph.D., and **Thomas P. Mog,** Ph.D.

Basagran for nutsedge

Problem: *We have a problem controlling nutsedge in lawns. We have tried Betasan without much success. What are we doing wrong? (Ohio)*

Solution: Perhaps you are mistaking Betasan for another product, bentazon (Basagran). Betasan is a preemergence herbicide for grassy weeds. Basagran is a postemergence herbicide which is very effective on nutsedge when applied to actively growing plants in late spring.

Yellow nutsedge is a serious weed problem of warm-season turf. It establishes by underground tubers or from germinating seed in late spring or early summer. Heavy populations can occur in July and August in areas thinned by summer stress, insects or diseases.

Basagran should be applied after seed has germinated in late spring but before tubers are formed. Repeat applications may be needed, but do not apply to newly seeded turf. Avoid mowing three to five days before and after applications.

Scab on crabs

Problem: *Scab was devastating last year especially to the flowering crabs. Will it be as bad this year and what can be done to help them? (Ohio)*

Solution: I agree with your observation that scab (*Venturia inaequalis*) was at unusually high levels in 1983. The weather last spring was ideal, cool and wet, for infection by and development of this fungus leaf disease. My observations were that the red or purple-leafed trees were more severely affected than those with green leaves. Some trees were, for all practical purposes, leafless by late June-July. Since these trees had their full compliment of leaves for less than half the growing season, the photosynthate produced (sugars) and stored (starch) for growth this year must be way below normal.

The fungus which causes scab overwinters in fallen leaves and on the twigs. Removal and destruction of last year's infected leaves helps. If we get a long, cool and damp spring the susceptible species, which include many of the flowering crabapples and hawthorns, will be in trouble again.

Three applications of an approved fungicide, the first applied just before the blossoms open (pink bud) and twice more at 7- to 10- day intervals, should provide satisfactory protection. If it is exceptionally rainy, more sprays will be needed. Fertilization is highly recommended to maximize the new growth you do get. Some states, Ohio being one, recommended late summer or fall fertilization for the scab problem.

The trees really looked bad last year and a few people have gone as far as suggesting that many might not make it throughout the winter. Thus your concern is certainly justified. Fungicide sprays and fertilization are needed to promote recovery and survival of this beautiful popular group of flowering ornamentals. The best solution to future scab problems is the use of disease-resistant varieties.

Avoiding herbicide contamination

Problem: *In our lawn care business, sometimes we experience herbicide injury of desirable ornamental plants. Would you please recommend some guidelines to correct the possible herbicide contamination of plants? (Michigan)*

Solution: Success in rescuing the plants from accidental herbicide contamination depends on several factors.

These include early recognition of the problem, timely and appropriate protective measures and type and concentration of the herbicides involved.

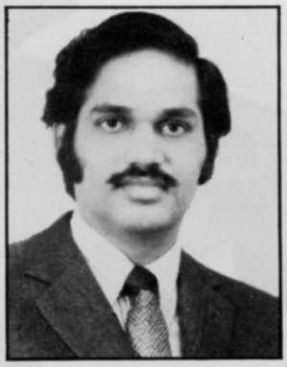
Drift and/or root uptake of lawn-applied materials are the primary cause of contamination from herbicides. Often accidental spillage also can present some problems. Depending on the application technique, delivery system and wind velocity and direction, materials may drift from the target area (turf) to nontarget plants. If 2,4-D, dicamba or other phenoxy herbicides drift onto gardens or ornamentals, apply water to dilute and wash off the chemicals.

These herbicides are less damaging to plants if they remain in soil rather than on the foliage. Reports suggest that any first aid treatment should be performed within three to four hours to get any benefit.

In some cases, light pruning of the affected plants and then watering to wash the chemical will help.

Ester formulations of 2,4-D can volatize and enter plants rapidly. Therefore, any corrective measures should be performed within one to two hours. Materials like 2,4-D Amine, Banvel and Roundup enter plants more slowly. Reports indicate that protective measures applied three to four hours after exposure could be beneficial.

Usually, a very low volume of material will be



Balakrishna Rao is plant pathologist and Thomas Mog is pest management specialist for Davey Tree Expert Co., Kent, OH.

Questions should be mailed to Problem Solver, Weeds Trees & Turf, 7500 Old Oak Boulevard, Cleveland, Ohio 44130. Please allow 2-3 months for an answer to appear in the magazine.

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delivered through drift. Therefore, if proper corrective measures are followed, it will not produce permanent injury. Roundup is absorbed only through green, living tissue and reportedly breaks down when it contacts soil. Thus it seldom presents problems of contamination unless it is through a directed spray.

If rain or irrigation has caused a problem with Banvel, use activated charcoal as an antidote. Reports indicate that herbicide rates of four pounds or less of active ingredient are counteracted with one pound of activated charcoal per 100 square feet incorporated to a depth of six inches. It may take six months to correct the contamination.

Since corrective measures are time-consuming, expensive and may produce variable results, it is best to correct the causes of possible contamination and, if possible, keep away from sensitive, desirable plants.

Rock salt the culprit

Problem: *The trees and shrubbery near our driveway and sidewalks are dying. Someone told me that the rock salt I use to melt the ice is killing them. How can I tell if salt is the problem and what can I do about it? (Minnesota)*

Solution: Rock salt is commonly used to de-ice roads and walks because it does the job and is inexpensive. Too much salt can injure plants. Look for discoloration of the leaves or needles. A marginal browning or tip burn of evergreen foliage may show up in winter or early spring.

Plants which are leafless during the winter will show similar scorch-type symptoms the following year. Less obvious is a gradual reduction in plant growth. Sometimes there is a premature fall coloration and leaf drop. This is especially true of salt-sensitive species such as sugar maple.

The fact that you use salt and that the plants closest to the salted areas are dying, makes rock salt reasonably suspect.

Rock salt is mostly sodium chloride and both sodium and chloride can be toxic to plants. You may want to use calcium chloride. Calcium chloride is more expensive, but not nearly as toxic to most plants. Be aware that although calcium chloride is safer, too much can cause salt injury.

You might consider using sand, sawdust or something like kitty litter to improve traction on icy surfaces. If there are white deposits on the plants, wash the salt off with water when the temperature gets above freezing. Plants appear to be more readily damaged by salt that is blown or splashed on them than by salt taken in through the roots.

The soil beneath the plants should be tested in late winter for soluable salts to determine whether salt is present at phytotoxic levels. If there is a problem, gypsum (calcium sulfate) applied at a rate of 50 to 75 pounds per 1,000 square feet can be used to "neutralize" the adverse effects of sodium chloride. Depending on your particular drainage situation, you may want to install curbing or channel salty runoff away from the trees and shrubs.

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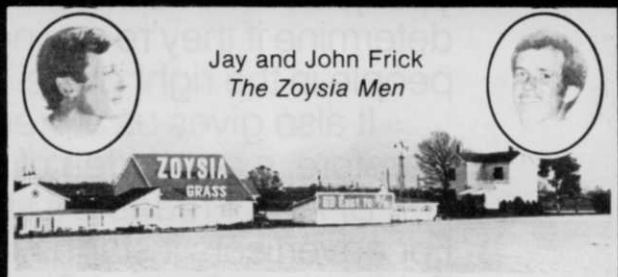

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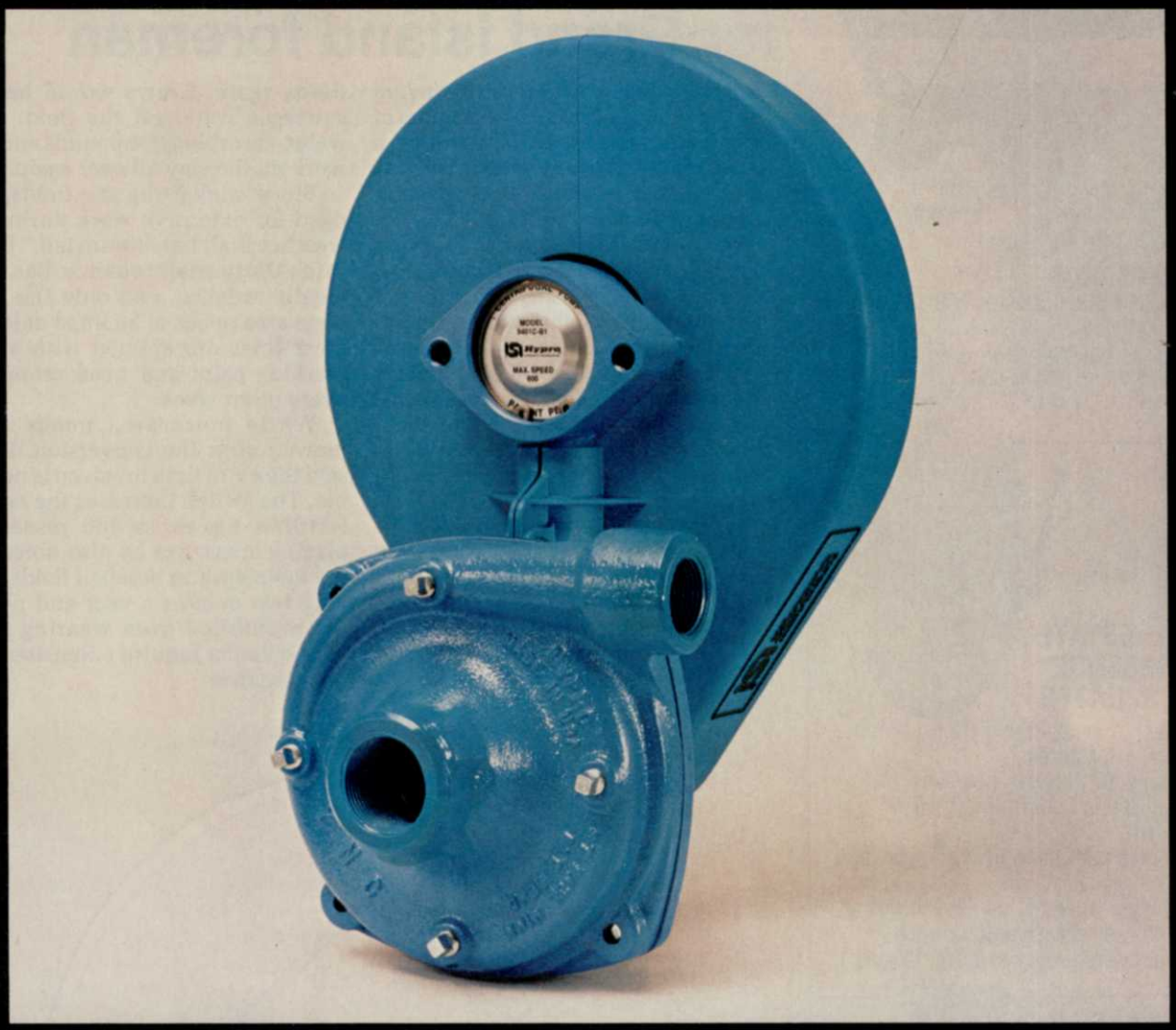

Easy to install, easy to maintain on tractor or trailer sprayers. And, now, Hypro has lower prices, too.

There's never been a lighter, tougher, lower cost centrifugal built! In the new Series 9400 Belt Drive Centrifugal Pumps, Hypro introduces the high volumes you want and the low pressures you need for accurate, reliable sprayer performance. You get Hypro quality and durability throughout…at a new low Hypro price.

Compare these features: 600 and 1,000 RPM models, 66 GPM or 75 GPM at 40 PSI. Positive timing belt drive, single bolt design for fast, easy pump and belt adjustment or removal. Super-tough epoxy-coated cast-iron housing. Stainless steel shaft. Corrosion resistant all-nylon impeller. And these are all standard!

Now is the time to look into the benefits of the new, low cost Hypro Series 9400 Belt Drive Centrifugal Pumps. Write today for full details.

Hypro®
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Circle No. 257 on Reader Inquiry Card

Estate Turf Spreader Model 700

$365.00
Freight Included

- Spread seed, fertilizer, lime, sand or de-icers
- Big 800 lb. capacity
- Ground driven
- Rugged Steel chassis with Polyethelene hopper
- Unique double-action drag chain prevents clogging while calibration is provided by 0 to 2½ sq. in opening

Model 108
$217.00
Freight Included

ESTATE "PRESSURE" SPRAYER

Perfect for spraying fruit trees, shrubs, yards, or pastures.

- Heavy duty 15-gal. poly tank.
- Adjustable booms sprays 10-ft. swath.
- Comes with hand held sprayer, and 10 ft. hose.
- Sprayer operates on 12-volt power, with easy access on/off switch.
- Lightweight, easy to store, (41 lbs.)

ESTATE "VERSATILITY" WAGON Model 300

$479.00
(5 ft. bed)

(Add $72.00 for dump option) Freight Included

- 1-ton hauling capacity with hand operated hydraulic dump system
- Heavy structural steel frame
- Removable Side Racks
- High Flotation Tires
- 5 ft., 6 ft. & 7 ft. beds available
- Also, single axle and tandem axle trailers available

Country Manufacturing, Inc.
P.O. Box 104 K-3
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(614) 694-9926

Circle No. 108 on Reader Inquiry Card

JOBTALK

Grass fields save hand work for Grand Island foreman

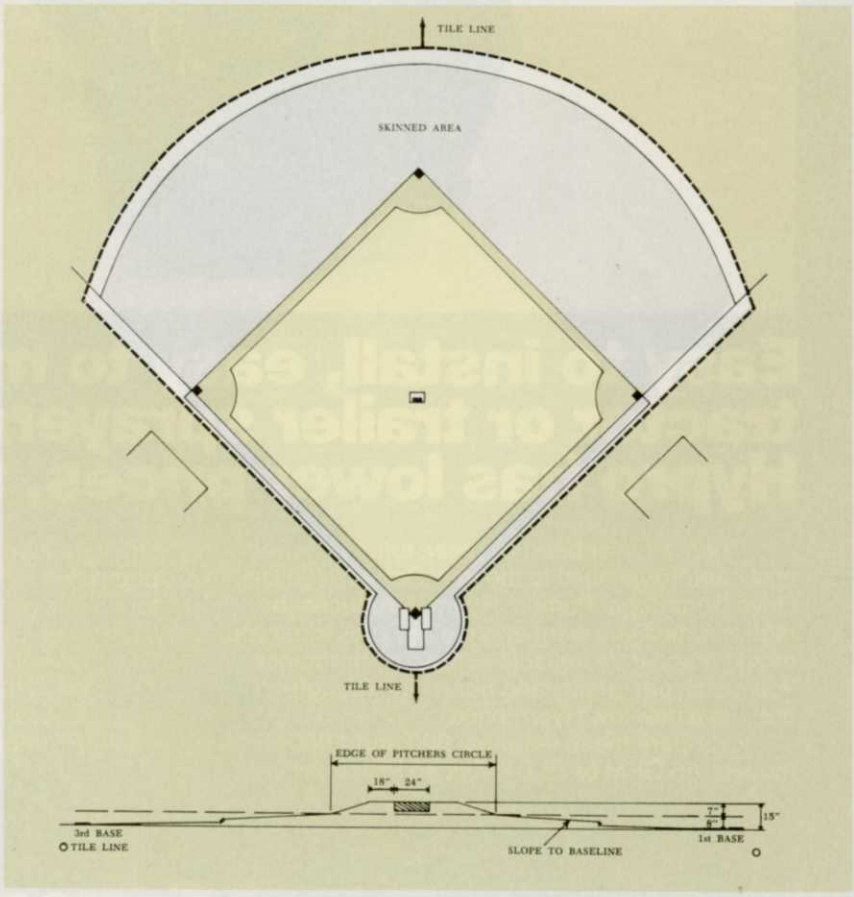
How do you cut costs and still provide the same level of service? Directors of municipal parks and recreation departments all over the country constantly ask themselves that question at budget time.

Raymond Billica, parks foreman for the town of Grand Island, NY, came up with one answer: his staff converted several of the town's baseball and softball fields into "all grass" fields. Only the eight-foot diameter pitcher's mound (on baseball fields) and a 12-foot diameter home plate area are left in clay, while the baselines and base areas themselves are overseeded.

Before converting the fields, Billica's crews screened the fields every day, hand raking the pitcher's mound, home plate and the bases. Foul lines and coaching boxes had to be marked out, and after heavy rains it took extensive manpower to shape up the fields again. Crews would have to squeegee water off the field, apply water-absorbing compounds and then work up the clay all over again.

Since converting the fields, "the need for extensive work during wet weather is all but eliminated," Billica said. Daily maintenance has been greatly reduced, and only the home plate area needs to be lined daily. All grass lines are applied with a field marking paint and need retouching every other week.

While more area needs to be mowed after the conversion, Billica said the extra time involved is negligible. The switch increases the need to fertilize, top dress and reseed the playing areas, but he also noted that the town's youth baseball fields (used only two months a year and players are prohibited from wearing metal cleats) do not require extensive extra maintenance.



Billica left only *an 8-foot diameter pitchers mound and a 12-foot diameter home plate area clay while baselines and base areas themselves are overseeded.*

Walk a fine line

Choose from Jacobsen's complete line of rugged walk-behind rotaries.

Get precise cutting and powerful performance—get a Jacobsen.

Choose from three cutting widths: 32", 36" or 50". And a variety of engines, from 8 to 16 hp.

These rugged, easy to handle machines are built for daily use. The mower decks feature heavy duty spindles and bearings. Plus heat treated steel blades.

Finger-tip controls make your job easier. A special traction clutch lets you handle tricky terrain, and allows free wheeling in neutral. A convenient gear selector gives you one reverse and five forward speeds.

Other standard features include: easy 4-point height adjustment; only two belts; large wheels and tires; a special guard for easy trimming around trees; and large fuel tanks up to 3 gallons.

Options include a comfortable trailing sulky; and a big 3.3 bushel grass catcher with dust deflector.

So get behind a Jacobsen. You'll be walking a fine line.

Jacobsen Division of Textron Inc.
1721 Packard Avenue
Racine, WI 53403. J-3-4

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TEXTRON
Jacobsen Division of Textron Inc.

Engineered from the ground up.
Circle No. 121 on Reader Inquiry Card

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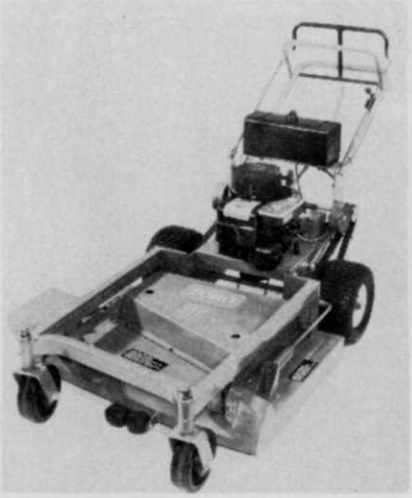
Toro unveils two walk-behind rotaries

Traction units that Toro says are more manueverable than any currently on the market are the main features of the new 36-inch and 52-inch walk-behind rotary mowers unveiled by the mowing equipment manufacturer this spring.

A unique T-Control steering design coupled with power reverse provides easy controlled operation for trimming near trees and other obstacles, while simply releasing the steering "T" stops the mower. The mowing decks on these models are the same size as used in Toro's Groundmaster riding rotaries, as well as the pin-and-bracket height of cut adjustment that lets workers quickly change cutting heights without tools.



Circle No. 180 on Reader Inquiry Card

Prescription blending with Basic 4 Injector

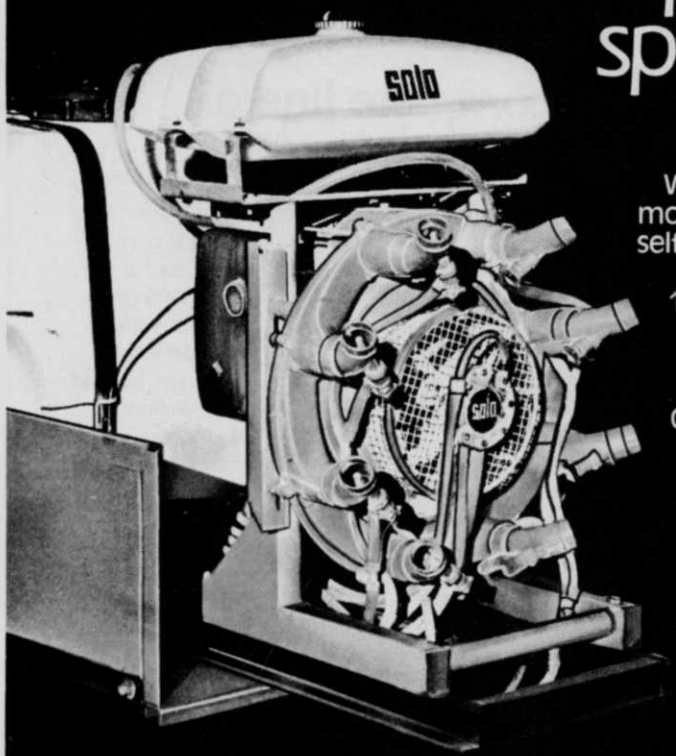
Now available to mount on your existing spray equipment, the Agro Chem Basic 4 Injector automatically injects from 1 to 4 products into your spray hose at any dilution desired. Powered by your existing pump, the Basic 4 mounts on all sprayers, records quantity of chemicals used and changes the chemical mix instantly on command. Special problems encountered on the lawn or fairway can be readily solved with the automatic custom-blending made possible with this device.

Circle No. 181 on Reader Inquiry Card

Shindaiwa model is lightweight trimmer

The Shindaiwa T-20 is designed to be the best trimmer value for the serious landscaper. Weighing 9.75 pounds, the T-20 is the world's lightest straight-shaft trimmer available, according to the manufacturer.

It includes a 1.1 hp 21.1cc engine.



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check with solo first

With the **Trac 419/32,** SOLO provides you with a modern low volume high concentrate mistblower, self-contained, mounted on a frame with 32 gallon formula tank and with its light-weight of only 130 lbs. empty, it is ready to fit any carrier, from pickup truck to garden tractor or trailer.

Or . . . build a system of your choice with SOLO'S **Trac 419,** using any tank or frame.

Or . . . modernize an old pump/air blast spray rig with SOLO's **Trac 419.**

The SOLO 419's come with their own powerful 12½ hp engines, prepiped and can treat a 40 ft. swath, 20 ft. high . . . or up to 50 ft. in any direction with optional **TELEBLAST** nozzle.

ULV application possible.

Also available with skid mounted 55 gallon tank.

Send for free brochure or ask your dealer for **SOLO Trac 419.**

SOLO INCORPORATED, 5100 Chestnut Avenue, P.O. Box 5030 - Newport News, VA 23605-0030.

solo

Circle No. 148 on Reader Inquiry Card

Before and after treatment for control of hydrilla with AQUATHOL® K Aquatic Herbicide.

Get results like this with Pennwalt Aquatic Herbicides

Pennwalt products control many troublesome weeds and algae, including hydrilla, coontail, milfoil and pondweeds.

Biodegradable

All Pennwalt aquatic herbicides are based on endothall. Endothall salts disappear rapidly from the water and soil through microbial degradation and do not accumulate in the food web. Properly applied, Pennwalt aquatic herbicides provide a satisfactory margin of safety to birds, mammals, and aquatic fauna. And Aquathol formulations have a wide margin of safety to fish.

Contact Action

Pennwalt aquatic herbicides kill weeds by contact. For best results, they should be applied as soon as the aquatic weed problem appears and weeds are actively growing.

Flexible Application

The application of Pennwalt aquatic herbicides can be fast, precise and economical. Application of liquid or granular formulations may be made by air, by boat or from the shore to treat small or large areas of lakes, ponds, rivers and canals.

Complete Line

The Pennwalt line of aquatic herbicides and algicides: an effective way to get rid of weeds and algae.

AQUATHOL® K Aquatic Herbicide
AQUATHOL® Granular Aquatic Herbicide
HYDROTHOL® 191 Aquatic Algicide and Herbicide
HYDROTHOL® 191 Granular Aquatic Algicide and Herbicide.

AGCHEM
PENNWALT
CHEMICALS ■ EQUIPMENT
HEALTH PRODUCTS

All pesticides can be harmful. Read label carefully and use only as directed.

Pennwalt Corporation, Three Parkway, Philadelphia, PA 19102 ● (215) 587-7219

ADV 8437/4-83/6958

Circle No. 139 on Reader Inquiry Card

The T-20 is built with an engine anti-vibration system for comfortable operation and a diaphragm carburetor for all-position cutting. Other features include electronic ignition, spark arrestor muffler, four ball-bearing gearcase and one-piece drive shaft.

Circle No. 182 on Reader Inquiry Card

Tennant offers 2-year sweeper warranty

The Tennant Model 360 rider sweeper offers customers the latest developments in sweeper design, warranty and factory support, according to the manufacturer.

The new sweeper uses a rotating seal that combines with the broom to hurl debris into the unit's 16 cubic-foot hopper for improved loading and larger payload. The seal also seals dust in the hopper. The unit sweeps a five-foot path at speeds up to 8.5 mph and can clean 178,000 square feet per hour. It's also backed with a 2-year, 2,000-hour warranty plus guaranteed parts shipments.

Circle No. 183 on Reader Inquiry Card

Fish fertilizer is odorless, convenient humus gives best for less

Albert's Best Odorless Fish Humus offers natural composted fish fertilizer in an easily handleable form.

Mixed with half wood by-products, the formula includes N, P, K, Ca, Mg, S and a large number of trace elements found in seaweed and other ocean products for a balanced plant diet. Albert's Best is free of weed seeds and nematodes due to the heat generated during the composting process, and has an inoffensive odor suitable for many applications, including use as potting soil.

Circle No. 184 on Reader Inquiry Card

MMM expands operations stateside

Europe's largest replacement reel and bottom blade manufacturer, Mowing Machine Maintenance, has opened shop in the United States with domestic headquarters in Andalusia, AL.

The firm uses specially-hardened steel similar to car spring material for its products, which attain tensile strengths of 110-120 tons. MMM super strength cutting cylinders utilize a thin cutting face with greater relief from friction, which provides a more precise cut for less power. Those cylinders also virtually eliminate break-

What makes a Cushman turf vehicle worth the investment:

Turn your crew's walking time into working time. It's the fastest way to increase productivity.

If you stop to figure how much time your crew spends every week —just walking— you'd probably be shocked.

You'd also understand the economics of taking your crew off their feet and putting them into one of our tough turf vehicles.

Take the Cushman Runabout®, for instance. It carries two workers and up to a half ton of fertilizer, sand, sod or supplies.

The Runabout's 18-hp engine features a 4-stroke cycle for extra torque and longer life (a 12-hp model is also available).

For smaller needs, and budgets, consider the Cushman Turfcart™. It too can transport a pair of workers at up to 14 mph. And there's cargo space for rakes, hose, trimmers or up to 250 pounds of other supplies. The sturdy 7-hp engine can run all day on just a little gas. And a sealed-beam headlight lets the work continue into the night.

A free demonstration.

Of course the best way for you to learn about the Cushman Runabout and Turfcart is to see them in action. Right on your own grounds.

To do that, contact your Cushman dealer or call toll free **1-800-228-4444.**

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CUT4-2045

Circle No. 109 on Reader Inquiry Card

ing, binding and mid-season grinding, according to the manufacturer. The reels are guaranteed from defects for one year while bottom blades are warranted for 90 days.

Circle No. 185 on Reader Inquiry Card

Walker Mower has compact features

The Walker Mower easily outmanuevers walk-behind mowers on the turf with its hydrostatic ground drive, while its compact dimensions get into the same tight spaces the walk-behinds reach without secondary cutting.

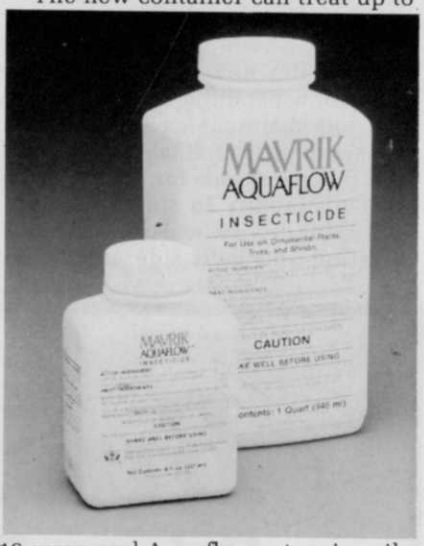
The first built-in grass catching system available in the industry with no external chutes, blowers or catchers to limit manueverability also comes with the Walker models. Other features in the compact rider include a low center-of-gravity that makes for easy handling on slopes, flexible cutting deck suspension, timed gear/PTO drive shaft for the blade drive to provide a compact deck size and low maintenance, and a tilt-up body for easy drive train servicing and maintenance.

Circle No. 186 on Reader Inquiry Card

Aquaflow available in quart containers

Mavrik Aquaflow, the broad-spectrum insecticide developed specifically for use on ornamentals, is now being packaged in one-quart containers in addition to the 8-ounce bottle currently available to the industry.

The new container can treat up to



16 acres, and Aquaflow acts primarily as a contact poison similar to photostable pyrethroids. It is effective against aphids, thrips, whiteflies, leaf-eating caterpillars, lygus bugs, flea-beetles, cucumber beetles and leafhoppers.

Circle No. 187 on Reader Inquiry Card

Coming in May
Trends in Trimming and Edging Equipment

CUSHMAN®

5064 Cushman, P.O. Box 82409, Lincoln, NE 68501

It works harder because it's built better.

Sickle bar mower gets tall grass, weeds

Sensation Power Equipment Division has added a sickle bar mower to its line of heavy-duty commercial lawn maintenance equipment.

Built with a 5-hp Briggs & Stratton engine, the new mower provides maximum handling ease, durability and low maintenance, according to the manufacturer. It features forward and reverse speeds for easier cutting maneuverability in small areas and unlocking drive wheels for easy transporation and both side and height adjustments.

Circle No. 188 on Reader Inquiry Card

Vibrating plow attachment new from Vermeer

The V-3018 vibratory plow, engineered specifically for the V-430 Trencher, is now available from Vermeer Manufacturing Co.

A self-contained hydraulic system provides maximum efficiency, while

the shaker-type unit uses the counter-rotating action of sealed vibratory weights to direct bury cable and flexible tubing up to 1-inch diameters. The V-3018 comes equipped with either 14-inch or 18-inch alloy steel blades.

Circle No. 189 on Reader Inquiry Card

Buckner®

Brings Beauty with 16 New Nyglas Valves for '84

For waste water, industrial, turf, drip, ornamental, residential and commercial installations.

- Combination angle/globe configuration with plug cuts inventory costs.
- Bodies of 30% glass filled nylon are corrosion resistant and nature proof.
- 1", 1½", 2" and 3" sizes.
- Low pressure loss.

ELECTRIC

2-way 24 VAC solenoid.

Buna N nylon reinforced diaphragm.

Model 20504
2" FPT

PRESSURE REGULATING

Adjustable pressure regulator features a locking device to maintain pressure settings.

Model 20106
3" FPT

CONTAMINATION RESISTANT

3-way solenoid normally closed.

Handles dirty water and effluent systems.

Model 20906
3" FPT

HYDRAULIC

Normally open.

Model 21603
1½" FPT

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Circle No. 145 on Reader Inquiry Card

Mustang shows its best colors

Turf tests conducted at Rutgers University indicate that Mustang, developed by Rutgers and Pickseed West, exhibits the deepest green color among 19 tall fescue cultivars.

It was given a color rating of 7.2 on a 9-point scale, followed by Olympic (7.0), Houndog (6.5), Rebel (6.2.), Falcon (5.5), Clemfine (4.4) and Kentucky-31 (4.3). According to the producers, turf data from major universities rank Mustang very high in overall turf quality, dark green color and disease resistance.

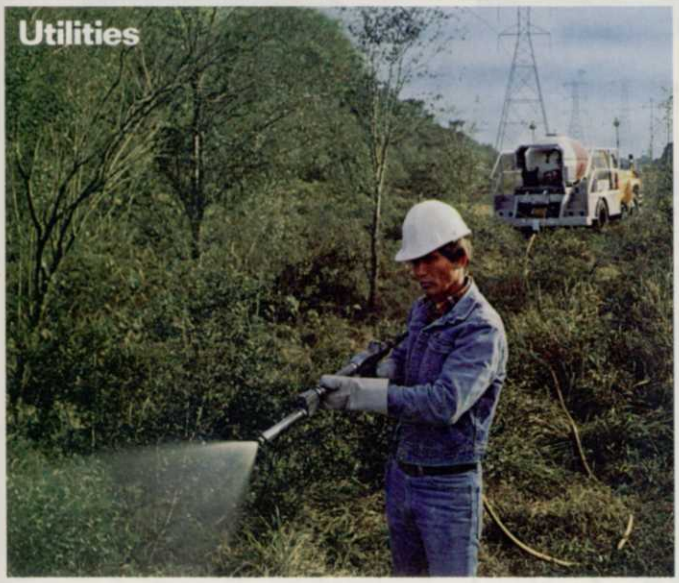
Mustang's tillering capacity is much greater than K-31, so it can produce adequate turf with lower seeding rates. The reduced rates provide turf that is a little more open than other types and therefore may be more tolerant of heat and summer stress.

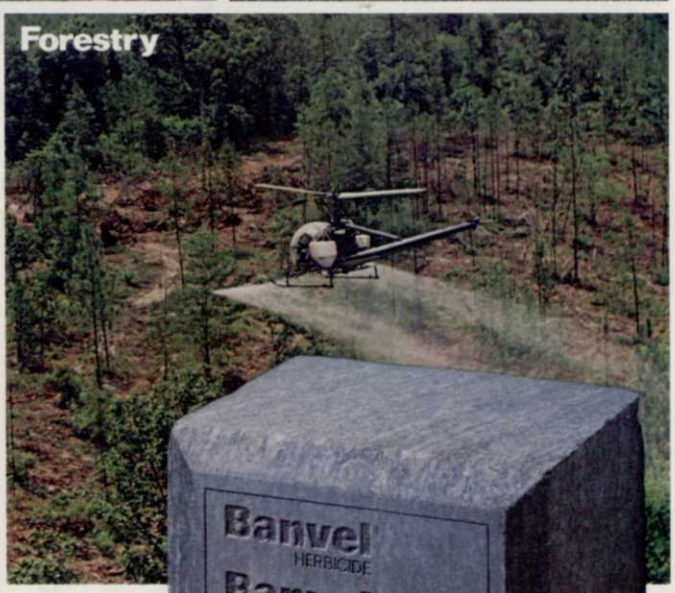
Circle No. 190 on Reader Inquiry Card

Sprayer/utility trailer kits available

Constructed of 10- and 12-gauge steel with baked enamel finish, J.F. Wirth & Sons' new line of sprayer/utility trailer kits hold up to 1,060 pounds.

The kit includes two 4-ply tubeless tires as well as fenders and all electrical wiring and tailights. The trailers





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herbicide

When you choose Banvel® herbicide products for vegetation management on roadsides, utilities, railroads, ditchbanks or in timber management, you . . .

- Leave native grasses intact.
- Get cost-effective results.
- Spray materials that are environmentally sound when used as directed.
- Control the broadest spectrum of broadleaf weed and brush species.
- Choose from a wide variety of approved tank-mix options.

Talk to your Velsicol representative and find out why Banvel herbicide products are the best way to build vegetation management programs that fit all your needs.

Banvel® herbicide products.

Your cornerstone of vegetation management

VELSICOL CHEMICAL CORPORATION

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Circle No. 156 on Reader Inquiry Card

are 48 inches long (overall length of 81.5 inches) with a 40-inch width. The class I coupler with the kit fits 1 7/8-inch trailer balls.

Circle No. 191 on Reader Inquiry Card

Spec introduces straw mulch tackifier

Az-Tac, a general purpose straw mulch tackifier, is available from Spec International Inc. for hydromulching and hydroseeding applications.

A suspension agent in Az-Tac keeps wood fibers and seed in suspension and imparts high lubricity to the mixture. This results in more mulch per load and a more uniform distribution of mulch and seed, according to

the manufacturer.

Circle No. 192 on Reader Inquiry Card

Aqua-GRO suppresses Poa on golf greens

Cornell University Agronomist Martin Petrovic has found Aqua-GRO, the soil wetting agent, to be effective and safe in suppressing *Poa annua* seedhead development on golf course greens. Suggested rates provide 60-70 percent seedhead reduction with no setback in turf quality. Two application, ten days apart, are recommended.

Circle No. 193 on Reader Inquiry Card

Classen Plugger fits in auto trunk

The Classen Model 200 Plugger Aerator fits easily into the trunk of a car. Stainless steel tines, driven by a 3 hp gasoline engine, can aerate 2,400

square feet per hour. The unit weighs 100 lbs. and can operate within three-inches of sidewalks.

Circle No. 194 on Reader Inquiry Card

The Way Some Bluegrasses You Wonder What

Nitrogen costs money. So does water for that matter. And bluegrasses need them both.

Well, most bluegrasses.

Tests have shown that Rugby tolerates heat and drought better than most bluegrass cultivars. Rugby held its medium dark-green color and overall vigor on restricted moisture conditions. That makes *less watering* highly feasible.

A similar result happened in tests measuring the

EVENTS

APRIL

University of Florida Turfgrass Field Day and Research Update, April 6. University of Florida campus, Fort Lauderdale. Contact Dr. Bruce J. Augustin, Ag. Research and Education Center, 3205 SW College Ave., Ft. Lauderdale, FL 33314 (305) 475-8990

California Landscape Contractor's Association 5th Annual Landscape Industry Show, April 4-6. Long Beach Convention Center, Long Beach, CA. Contact CLCA, 1419 21st St., Sacramento, CA 95814 (916) 448-CLCA

Southeastern Turfgrass Conference, April 16-17. University of Georgia, Tifton. Contact Dr. Glenn W. Burton, Coastal Plains Experiment Station, Tifton, GA 31793 (912) 386-3353

Carolina's Shade Tree Workshop, April 17-18. Duke Power Bldg., 1600 Woodlawn Road, Charlotte, NC. Contact McNeary's Arborist, Inc., PO Box 11544, Charlotte, NC 28209 (704) 332-4628

Turf and Landscape Institute Golf Course Session, April 23-25. Anaheim Convention Center, 800 W. Katella Ave., Anaheim, CA. Contact Ed McNeill, Southern California Turfgrass Council, 100 Concha St., Altadena, CA 91001 (213) 798-1715

MAY

Arizona Turf and Landscape Conference and Trade Exhibit, May 3-5. Ramada Inn, McDowell Road, Phoenix, AZ. Contact William R. Kneebone, University of Arizona, Dept. of Plant Sciences, Tucson, AZ 85721 (606) 621-2211

University of California-Riverside Campus Turf Management Seminar, May 24. Riverside Campus Auditorium. Contact Cooperative Extension Service, 21150 Box Springs Road, Riverside, CA 92507 (714) 683-6491

JUNE

Kentucky Cemetery Association Annual Convention, June 9-11. Executive Inn, Louisville, KY. Contact Lewis Tingley, Resthaven Memorial Park, PO Box 18068, Louisville, KY 40218 (502) 491-5950

Fertilizer Institute Marketing Conference, June 10-13. White Sulphur Springs, West Virginia. Contact Pamela Lucas, The Fertilizer Institute, 1015 18th St. NW, Washington DC 20036 (202) 861-4900

Minnesota Park Supervisors Association Annual Equipment Show, June 15. Dred Scott Playfield, Bloomington, MN. Contact Lyle Rude, City of Bloomington, 2215 West Old Shakopee Road, Bloomington, MN 55431 (612) 881-5811, Ext. 282

Turf Seed Annual Seed Day, June 21. Hubbard, OR. Contact Turf-Seed Inc., 77 West G. St., Hubbard, OR (503) 981-9571

To insure that your event is included, please forward it, 90 days in advance, to: WEEDS TREES & TURF Events, 7500 Old Oak Boulevard, Cleveland, OH 44130.

need for nitrogen. Rugby scored well at low to moderate nitrogen fertility levels. And maintained good turf quality and density under no-nitrogen conditions.

In short, Rugby needs *some* nitrogen, but it doesn't need to wallow in it. So you can spend your time and money where it does more good.

But not on extra fungicide. Rugby resists Fusarium blight, leaf spot, dollar spot, stem rust, and powdery mildew.

Rugby also offers you the benefits of a low growth habit. And only the *blades* grow vertically. So mowers clip the leaf ends only, not the crucial growth-sustaining lower stems.

With Rugby, you can have rich, dense Kentucky bluegrass. For less nitrogen. Less water. And less time.

That's nothing to snort at.

Rugby
KENTUCKY BLUEGRASS
For low maintenance turf

Circle No. 146 on Reader Inquiry Card

Devour Nitrogen, You're Raising.

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Instructional and technical material designed to aid you in your work.

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340 - CONSTRUCTION DESIGN FOR LANDSCAPE ARCHITECTS $39.50
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510 - HORTUS THIRD $125.00
690 - INSECTS THAT FEED ON TREES & SHRUBS $47.50
635 - IRRIGATION PRINCIPLES AND PRACTICES $39.95
395 - LANDSCAPE ARCHITECTURE $34.95
300 - LANDSCAPE DESIGN: A PRACTICAL APPROACH $19.95
370 - LANDSCAPE OPERATIONS: MANAGEMENT, METHODS & MATERIALS $21.95
645 - MANAGEMENT OF TURFGRASS DISEASES $24.95
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620 - TURF MANAGEMENT HANDBOOK $18.00
110, 120 - TURF MANAGERS' HANDBOOK $28.95 hardcover, $23.95 paperback
650 - TURFGRASS MANAGEMENT $21.95
630 - TURFGRASS:SCIENCE & CULTURE $27.95
655 - TURFGRASS:SCIENCE & CULTURE LABORATORY MANUAL $12.95
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WTT 44

HOW TO SELL LAWN DISEASE CONTROL, AND DELIVER IT.

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SCLEROTINIA DOLLAR SPOT

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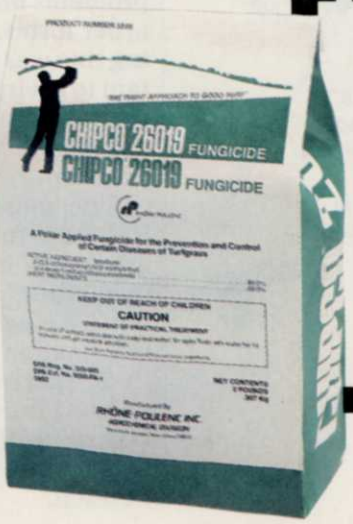
Selling disease control is a great way to boost profits and attract new customers.

And CHIPCO® 26019 is the ideal product to help you do both.

The selling proposition: a beautiful, disease-free lawn.

Everything you do for a customer is designed to create a beautiful lawn. Turf diseases look bad...and that can make *you* look bad. A programmed approach includes an effective, long-lasting fungicide like CHIPCO 26019 keeps your customers satisfied.



CHIPCO 26019 is the only fungicide you need.

It can be used safely on all lawn grasses nationwide to control the major turf diseases like leaf spot, dollar spot, fusarium and brown patch. Highly effective and long-lasting, CHIPCO 26019 fungicide fits into your treatment schedule and reduces callbacks.

In short, when you've got CHIPCO 26019 on the shelf, you're ready for *business.*

Send for FREE booklet on how to sell disease control.

We've put together a booklet that details lots of effective techniques and tools for selling disease control to your customers...and delivering it with effective, long-lasting CHIPCO 26019 fungicide.

Turf Fungicide

CHIPCO® 26019

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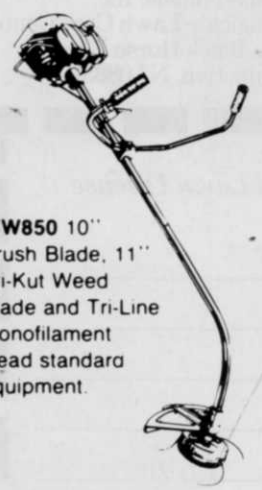

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For further information write:

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Circle No. 114 on Reader Inquiry Card

COMPUTERS *from page 66*

Tree inventory cards and work forms are needed in establishing technical information for the computer master file. This data will vary according to environment, type of organization, and individual needs.

Things to consider when setting up the technical forms are:

1 any type of hazard
2 insect problems
3 disease problems
4 root problems
5 tree species
6 diameter
7 height
8 spread
9 type of pruning (thin out, lift skirts, line clearance)
10 stake young trees
11 tree planting
12 grind stumps

When you get the first computer readout, you might be surprised to find you are spending far too much time on one certain type of tree. If this were the case, you could plan to remove unwanted, high-maintenance trees, or make sure that species is not planted in the future.

It is not practical in a small city to remove all unwanted species just because the computer printout identifies a problem.

Just recently, the tree statistic printout gave us the numerical amount and tree varieties pruned in a one-month period. The information was very helpful and informative in making out my monthly reports.

In the beginning we had a few problems filling out the new work order forms, but with some training this was corrected. It is important to get input from the field personnel, especially when making any modifications to the existing program.

The most important factor is just how functional is your program and is it an improvement over your previous record system? We have found the printout information has been very helpful in preparing monthly reports, annual budgets, and special reports to the Parks and Human Services Commission and City Council. **WT&T**

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	Hydraulic Mulching (2 people) ($12 per hour)	*Straw Mulching (6 people) ($12 per hour)*
HIDDEN OVERHEAD *1. Start-up* • *Pick up* • *Prep & load equipment* • *Travel time* • *Set up*	**$30**	**$156**
2. Shut-down • *Break time* • *Clean-up* • *Loading* • *Travel time*	**$60**	**$216**
TOTAL OVERHEAD	**$90**	**$372**
VARIABLE COSTS *1. Materials (per acre)* • *1500 lbs HYDRO MULCH fibers vs. 100 straw bails*	**$200**	**$125**
2. Application (per acre) • *Hydro seed, fertilize, apply HYDRO MULCH fibers vs. hydro seed, fertilize, apply straw, crimp*	**$31**	**$39**
3. Equipment (per acre) • *Fuel, maintenance, depreciation*	**$30**	**$50**
TOTAL VARIABLE *(per acre)*	**$261**	**$214**
TOTAL INSTALLED COST	**$351**	**$586**

In many of today's projects, hydraulic mulching with HYDRO MULCH fibers can be less costly than straw mulching. That's because there's usually less hidden overhead. So while savings vary from project to project, you owe it to yourself to find out more. After all, the results are in black and white.

To see if Conwed can save you money on your next project, call (612) 221-1196. Or write us: Conwed Corporation, Fibers Division, P.O. Box 43237, St. Paul, MN 55164.

*HYDRO MULCH is a federally registered trademark of Conwed Corporation. Any use of HYDRO MULCH beyond reference to Conwed's wood fiber mulch may constitute infringement under the Trademark Laws of the United States.

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innovative products for better environments

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SURVEY *from page 46*

nance, including mowing, roads, buildings, a golf course, and the West Point stadium. When you have 16,000 acres to take care of, 1,500 of this high maintenance, you simply don't have time to give plants the special attention they need.

In past surveys, we have found automonous park districts receive stronger support for the horticultural and agronomic needs of landscapes. Joel Carter, chairman of the Ornamental Horticulture Department, California State Polytechnic University, Pomona, suggests the best park administrators are those who appreciate horticulture and park management. "Lean too much in either direction (horticulture or park administration) and your ability to make decisions is limited," Carter said.

Public schools

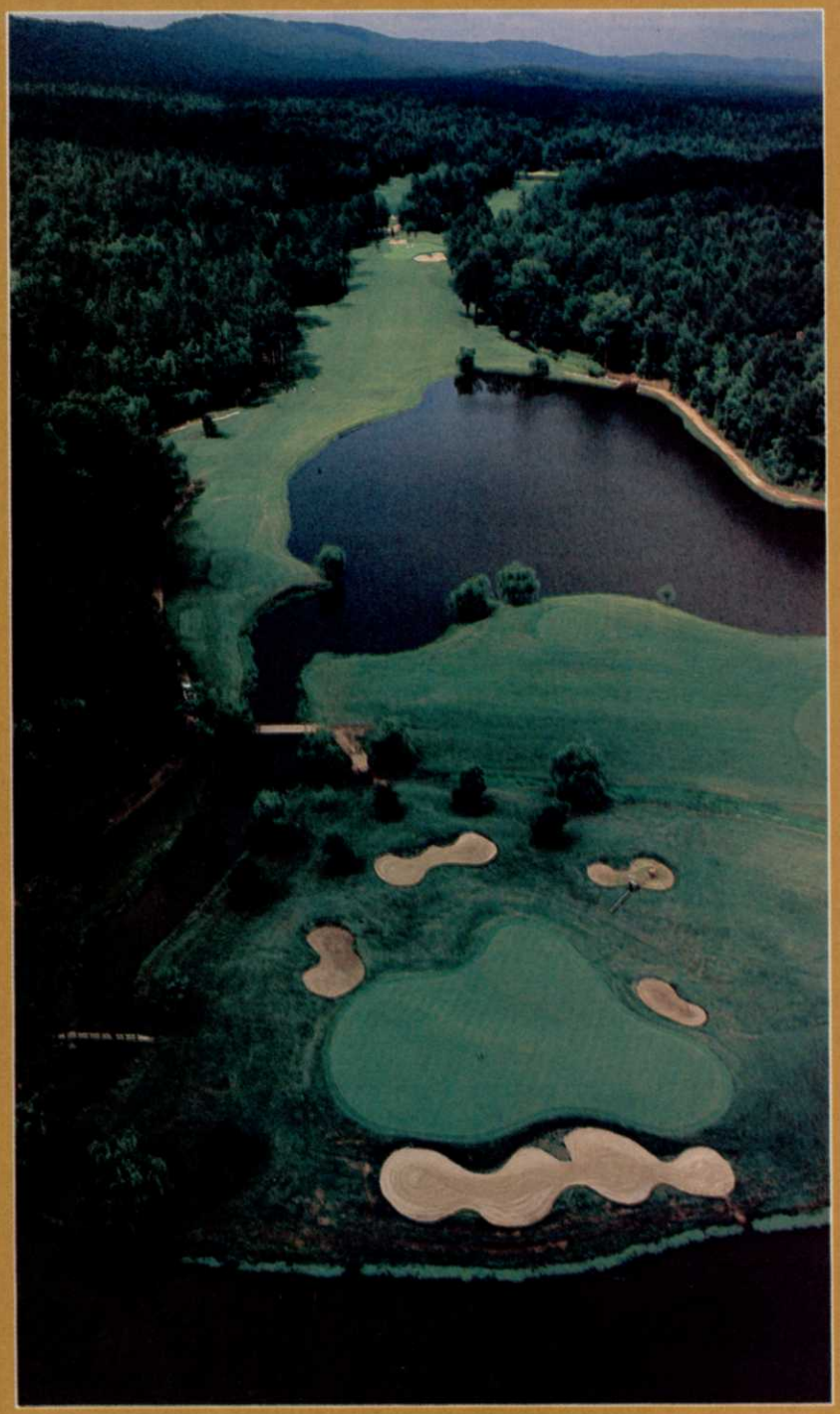
If managers of park landscapes have to constantly sell their programs just to meet basic needs, imagine what managers of public school landscapes have to face. At least in a park the purpose is recreation in a natural, outdoor setting. At schools, the purpose is education, and everything else is secondary.

For this report we interviewed maintenance managers and school superintendents. Clarence Lee, maintenance manager of Valley View Schools, Romeoville, IL, is responsible for 350 acres, 16 schools and a $750,000 budget. His staff of five does it all, often transporting equipment from one school to another.

"My biggest job is keeping kids off the grass while we are trying to make repairs," Lee said. "In the summer I use CETA workers to help us catch up. During the growing season, we spend nearly all our time mowing. It takes us a week to do all the schools and then we start over again. The three high school football fields receive special attention, including aerification, extra fertilization and weed control. Our budget to do all this has grown about five percent per year."

The budget is slim and needs

1984 PGA putts on PENNCROSS



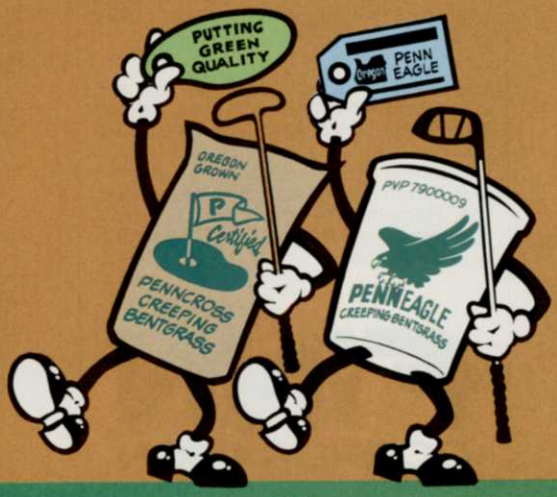
18th green at Shoal Creek, Shoal Creek, Alabama

Shoal Creek, Alabama

At the rugged Shoal Creek course, host of the 1984 PGA Championship August 16-19, 1984, the touring professionals will again be putting on Penncross creeping bentgrass. Penncross and Penneagle, the Penn Pals, are no strangers to the pros. Most of the recent major championships have been played on one or the other. The Western open at Butler was played on Penneagle fairways and greens. The 1983 US Open at Oakmont was played on Penneagle tees, fairways and greens. Maybe you saw the sixty-foot putt on Penneagle.

So, when the Shoal Creek course was designed, it's no wonder Penncross was specified for the putting surface. It was a 'natural' to choose Penncross bentgrass, with its glorious history, for a course with a sparkling future!

The PENN PALS



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are basic for Ervin Himmerich, maintenance manager of New Richland School District, MN. He has to focus on priorities, such as changing the track to metric and the football field. However, he does apply postemergence herbicides in the spring and fertilizes athletic fields.

Edward Schultz is landscape manager for two school districts in Iowa, Elkhorn and Kimballton. He reports to two school boards and has a combined budget of $85,000.

Schultz relies on Iowa State University agronomists for big problems, yet he leaves most chemical decisions to his staff of four. The two systems put the emphasis on their football and baseball fields, out of a total of 17 acres of turf. He makes certain herbicides and fertilizers are applied each year. His equipment includes one garden tractor, a gang mower, and a custom-built sprayer.

Richard Stegman is director of buildings and grounds for Goodland Unified School District, Goodland, KS. The district has 14 buildings and 40 acres. Again, summer CETA workers help Stegman out.

Stegman's main concerns are energy costs and the physical structure of the school system, such as plumbing, painting, and electrical.

For the landscape, he depends greatly on his extension agent and his equipment dealer. He uses one John Deere and one Ford farm tractor, two Ford riding mowers, a 72-inch Excel Hustler mower, and a 110-gallon boom sprayer. He uses liquid fertilizers and herbicides.

William Armstrong is superintendent of schools, Bellvue, KY, a city of 8,000. His mind is occupied mainly with the education and welfare of 1,100 students. For the fields, which he "is attempting to keep grass on", he relies on extension for expertise. There is no one person specifically in charge of grounds, nor is there a budget for grounds. But, he believes roughly $500 to $1,000 is spent each year for seeding, fertilizing and renovating. The district uses a commercial service for fertilization and weed control when needed.

Public relations

As the computer is included more in the management of public landscapes, the doors also open for better communication with taxpayers. Since many public agencies share computers, they have the ability to share data. If the school district or parks department has a mailing list, landscape managers may be able to share this list to present their case to the public.

Perhaps the separate landscape department in Lenoir, NC, is an exception. But, it may also represent a trend. Schools and recreation are often given separate status, why not landscape management?

The way to achieve this beneficial status is through public relations, educating the public to the importance and special needs of plants as opposed to buildings, roads and sewage systems. The computer gives landscape managers the chance to state their case directly to the taxpayer, with accurate data. **WT&T**

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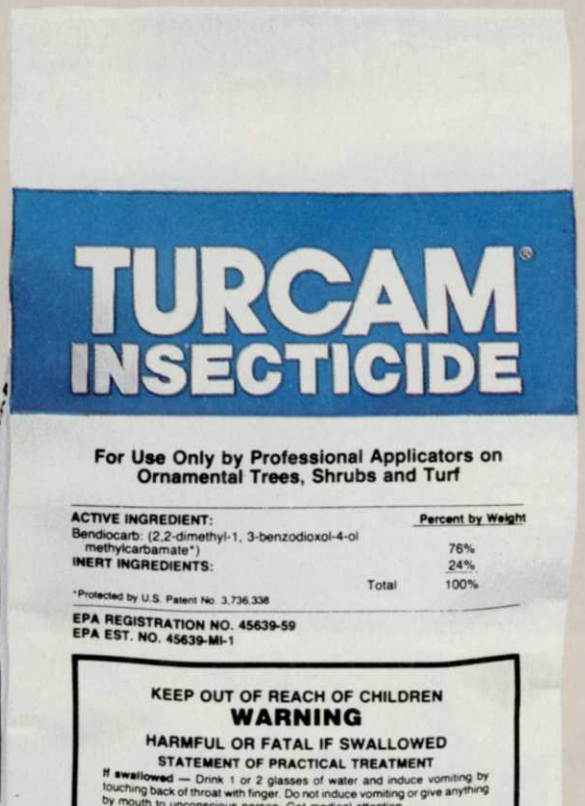

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Lewis Mitchell *cares for a flower bed in Jackson Square.*

"We're here to put in more than our eight-hours. We take a lot of pride in what we do." — Bailey.

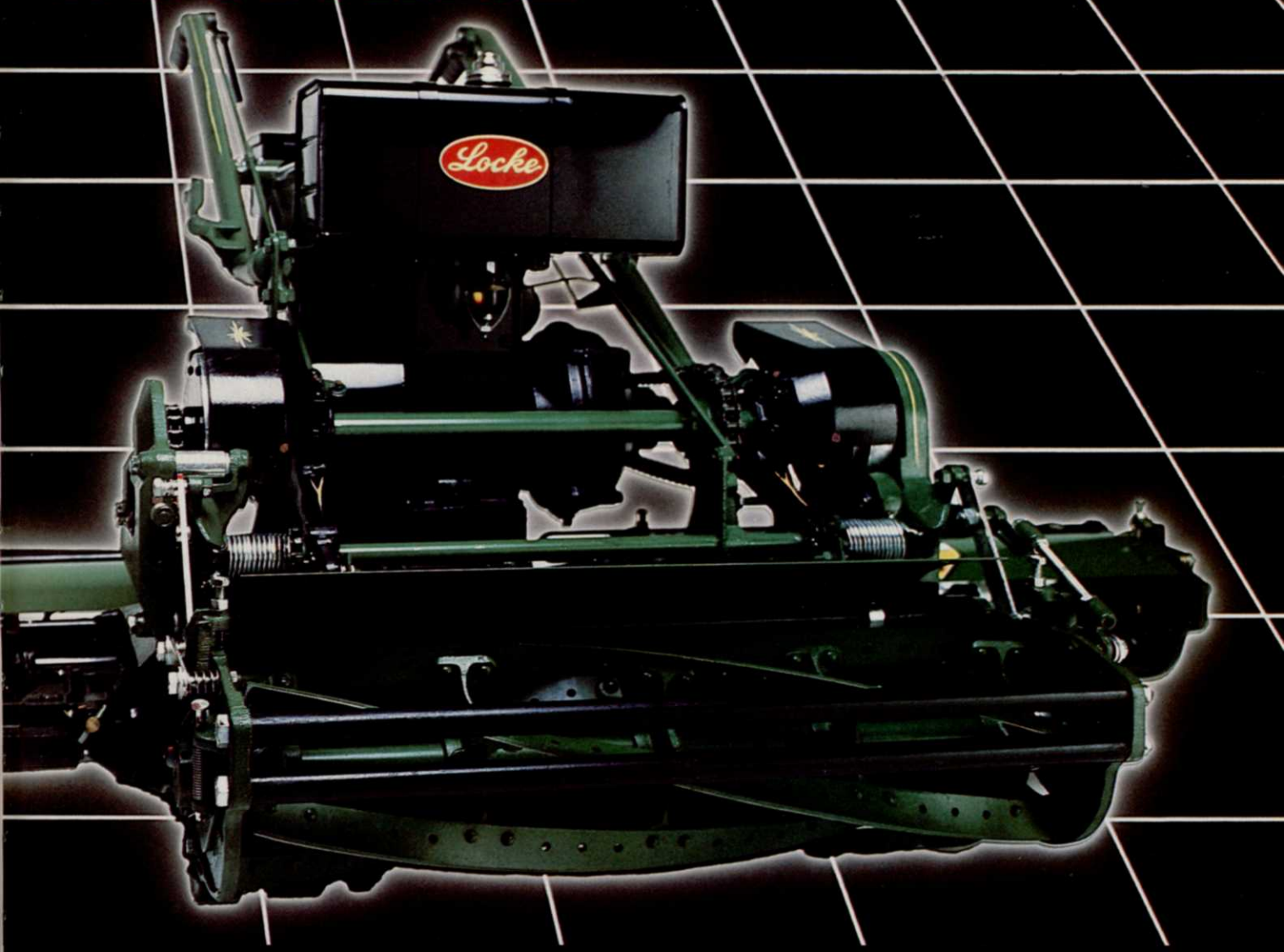
work. In fact, they seemed to attract more of them. Then we started spraying with Sevin which has slowed them down, but they're still a nuisance. People have begun making their own traps. Japanese beetles effect more than 300 different species of trees and shrubs. There aren't many things they don't like."

Mowing in most parks and around three electrical substations is contracted out.

There is no irrigation on ballfields, but Bailey is in the process of developing an irrigation system for one of them. **WT&T**

Left to right: *Oak Ridge parks crew Lewis Mitchell, Ken Lemons, Larry Bailey, William Rhodey and Eugene Wells.*

THE ULTIMATE MOWING MACHINE



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- uses of turf
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- AND MORE

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ARLINGTON *from page 59*

tion building. He will also be gearing up for the cemetery's busiest day -- Memorial Day. Usually, the President makes an address from Arlington.

Dihle maintains a 1/2-acre nursery where various replacement shrubs are grown.

Asking Congress for landscape money

Arlington National Cemetery, unlike most other national cemeteries, is under the Dept. of the Army, not the Veterans Administration. Because of this, cemetery superintendent Raymond J. Costanzo goes directly to Congress for funding.

"We've been very fortunate to have increased funding which is allowing us to improve our total maintenance program," said Dihle.

This year his budget breakdown includes (without salaries):

- $150,000 — grounds maintenance supplies
- 40,000 — equipment
- 60,000 — tree maintenance (spraying and pruning)
- 40,000 — tree planting
- $10-15,000 — other contractural work

Dihle holds a Bachelor of Science in Botany degree from the University of California at Davis. He has worked as a nurseryman in Sacramento before working with the Department of Agriculture as an ag inspector in Galveston, TX and Spokane, WA. He later worked in the D.C. area.

"I really missed ornamental horticulture, though, and when the job at Arlington became available, I was very eager for the opportunity to get back into it."

Besides issuing and writing all contract work, Dihle is technical advisor to the superintendent and acts as a consultant for all future landscape work to be done at Arlington. Eventually, the cemetery will be expanded to its full 612-acre potential. Dihle issues a weekly work agenda and meets daily with foremen. He also takes care of the Soldiers' Home and Airmen's National Cemetery, a 15-acre cemetery in Washington, D.C. **WT&T**

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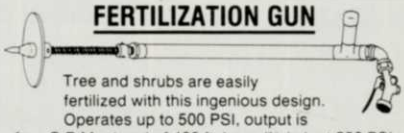

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Standard gun, 12" soil probe, 47 inches overall length, 4.5 lbs., $92.50 *includes shipping.*

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EQUIPMENT FOR SALE. Roseman Hydrogang Mower mounted on a MF-135. Wheel Roll Irrigation System and irrigation pipe 2" to 8" with mains. Medina Sod Farms, 14349 Burton City Road, Orrville, Ohio 44667. 5/84

SALE--SALE--SALE--Hannay **12 volt base mount reel motors,** $100.00 (new). Regular $160.00. FMC **(John Bean)** parts and pumps at discounted prices. **Hypro pumps** parts and accessories at **25%** discount. Call: Strong Ent., Inc., Collect: (305) 264-5525. TF

1982 300 gallon Myers Sprayer, 25 GPM centrifugal pump, all extras included, less than 30 hrs. use, kept in storage. $5,000. Call (617) 686-5904. 4/84

TREE CARE SERVICE company, North Central Ohio Location. This long established firm is available on a turn-key basis. For information contact Hal Maxfield, (419) 529-3333, Tom Mattox & Co. REALTORS, Mansfield, OH. 4/84

VERMEER TS-66 Tree Spade with new hoses and up dates. Mounted on 1977 International Loadstar 1850, with DT-466, diesel, low miles, 13 speed, twin screw, new radial tires, excellent condition. Price $25,000.00. (402) 423-4126. 4/84

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For Sale: Two Bean 1010 Sprayers, two Hose reels, 150 feet of hose each. One unit $2,800.00, one unit $2,000.00. Excellent condition. Call Bruce, 218-367-2033. 6/84

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2 FMC Tree Spraying rigs for sale. (1) 1000 Gal. SS/tank, 50 GPM Pump. (1) 600 Gal. SS/tank, 35 GPM Pump. Both with electric reels, hose & gun. Call after 5:00 p.m. (914) 357-7180. 4/84

Toro Parkmaster, 9-gang Fairway, Gas, $11,500. Jacobsen F-10, 7-gang, Gas, $9,500. Par-Mar Cars, Inc., Mt. Pocono, PA 18344, (717) 646-0978 or 646-1533. 5/84

Vermeer Model 10 Stump Cutter $4,500.00. 16" Mitts and Merril Chipper $4,500.00. Both in A-1 condition. Call (614) 753-3628 or write Altier & Maccombs Complete Tree Service Inc., P.O. Box 396, Nelsonville, OH 45764. 4/84

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VERMEER STUMPER — 1560, good condition. New engine 1981. Wis. Tree Expert Co., 3808 Sell Street, Wausau, WI 54401. $6500. 715-842-0619. 4/84

FOR SALE: (3) 550 gallon spray tanks. Unit is self-contained with 16 H.P. B/S twin cylinder motor and Meyers 2C95 pump - custom filtration system, manual Hannay reel, adjustable pressure and agitator valve and gauges. Excellent for tree and turf business. Phone: (312) 537-6590. 4/84

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WANTED: Large Lindig and Royer Shredders. Lewis Equipment, 320 Third Street S.W., Winter Haven, FL 33880. (813)294-5893. 6/84

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WANT TO BUY used Brouwer Harvester. 1-513-879-1538. E. Gilbert. 4/84

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Lawn Maintenance Supervisor. Commercial maintenance firm needs qualified person for supervisory position. Degree in and/or experience in agriculture related field a must. Send resume to Production Manager, Maintain Incorporated, 2549 Southwell, Dallas, TX 75229. (214) 241-2202. 4/84

Landscape Maintenance Sales position available in Dallas, Houston and Oklahoma City for aggressive, responsible sales representatives. Applicants should hold degree in horticulture or related field. Experience is a plus but not required. Career oriented individual only considered for this position, offering base salary, car allowance and commission. Send resume for review to Sales Manager, Maintain Incorporated, 2549 Southwell, Dallas, TX 75229. (214) 241-2202. 4/84

Landscape Maintenance Pesticide Applicator. Commercial maintenance company seeks knowledgeable, aggressive individual with experience in all aspects of pesticide applications. Must have or be able to attain a Texas Certified Pesticide Applicators License. Send resume to Branch Manager, Maintain Incorporated, 2549 Southwell, Dallas, TX 75229. (214) 241-2202. 4/84

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C

Groundwater, prenotification are becoming emotional issues

Concern over groundwater pollution and urban pesticide spraying is resulting in overly restrictive local legislation based upon fear and emotion instead of facts.

Lack of an organized defense at the local level is causing problems not only for local applicators and chemical companies, but for state and Federal environmental protection agencies and Congress.

"Local governments are trying to ban uses of pesticides without scientific basis," says Ray Brush, executive director of the National Landscape Association. "What happens to a pesticide on Long Island, with its high water table and sandy soil, will not happen everywhere. News coverage of EDB and dioxin is used by environmentalists as if it were the same for all chemicals in all locations. That's not true, and EPA is aware of this. Since EPA is required to base its decisions on facts, it would be fair for EPA to prevent local agencies from restricting chemicals and their uses without consideration of the facts."

It wasn't facts that cancelled DDT. It was the emotional picture of young, rare birds dying because the shells of their eggs were too thin. Once the impression of dying birds was made, facts carried little to no weight in the minds of the public and their representatives.

Every effort has to be made to confront emotion with facts at the local level. Without answers or an organized defense, local lawmakers are going far overboard. When enough local agencies go overboard, the issue becomes a national one, an emotional national issue.

Public education leans toward grantholders, not good teachers

It used to be good teachers were secure in their jobs. Then, universities started requiring teachers to publish in recognized journals. This meant teachers also had to be researchers and writers. Now, they have to be salesmen too, selling their research to foundations and companies in exchange for grants.

Whatever happened to the good teacher? What is happening to students who have become second or third in the importance of their instructors? Somehow, university administrators have lost track of their primary job, educating students.

Bruce F. Shank

by Bruce F. Shank, executive editor

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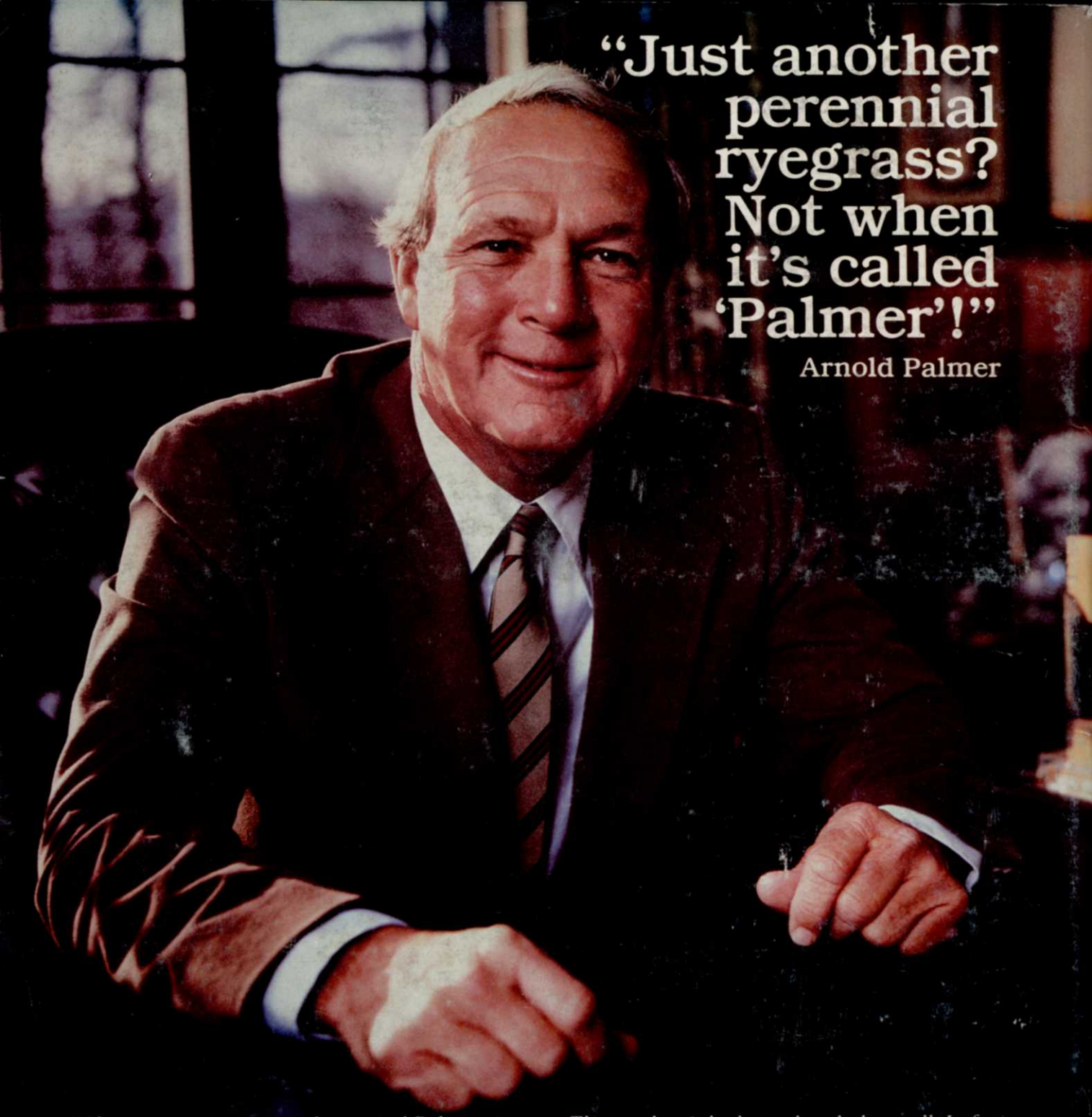

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